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OF THE KANSAS MEDICAL SOCIETY

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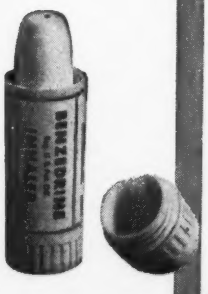

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1. Watson, B. P.: J. Clin. Endocrinology 4:571 (Dec.) 1944.

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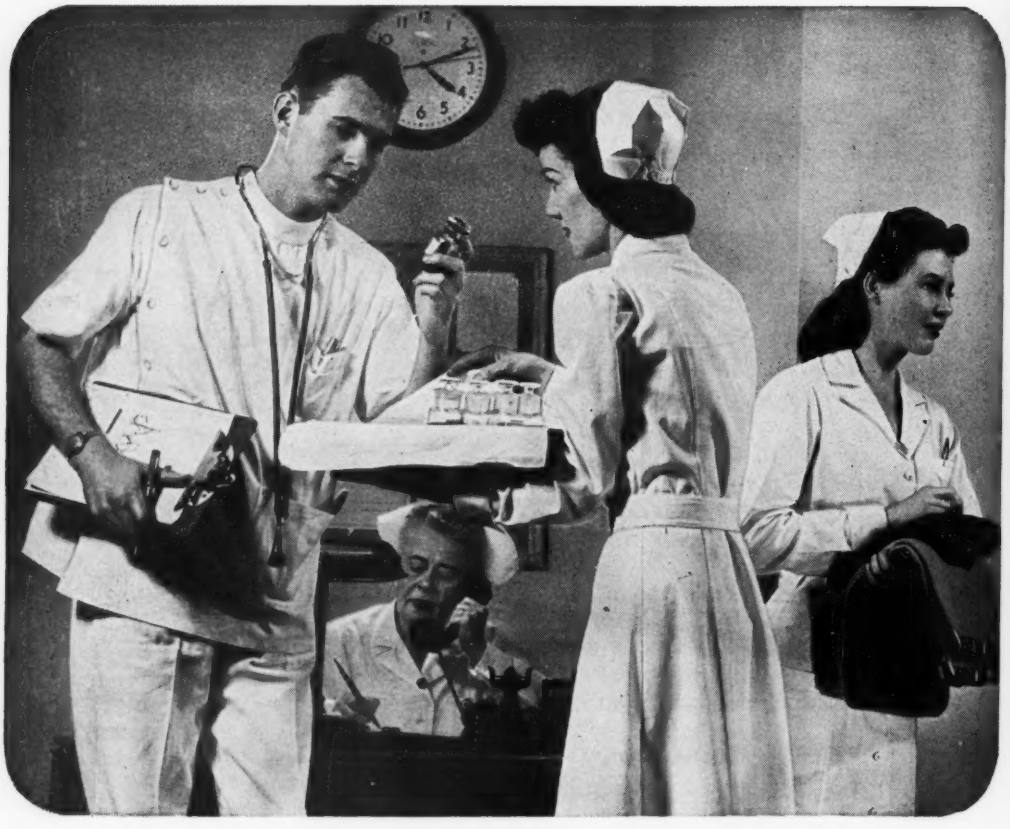

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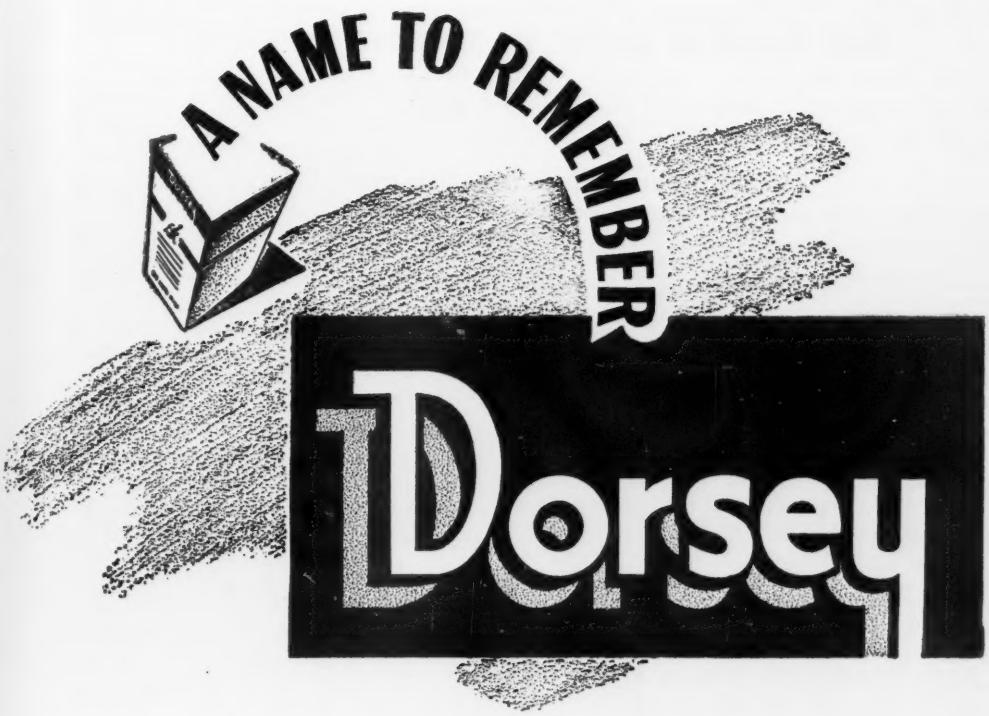

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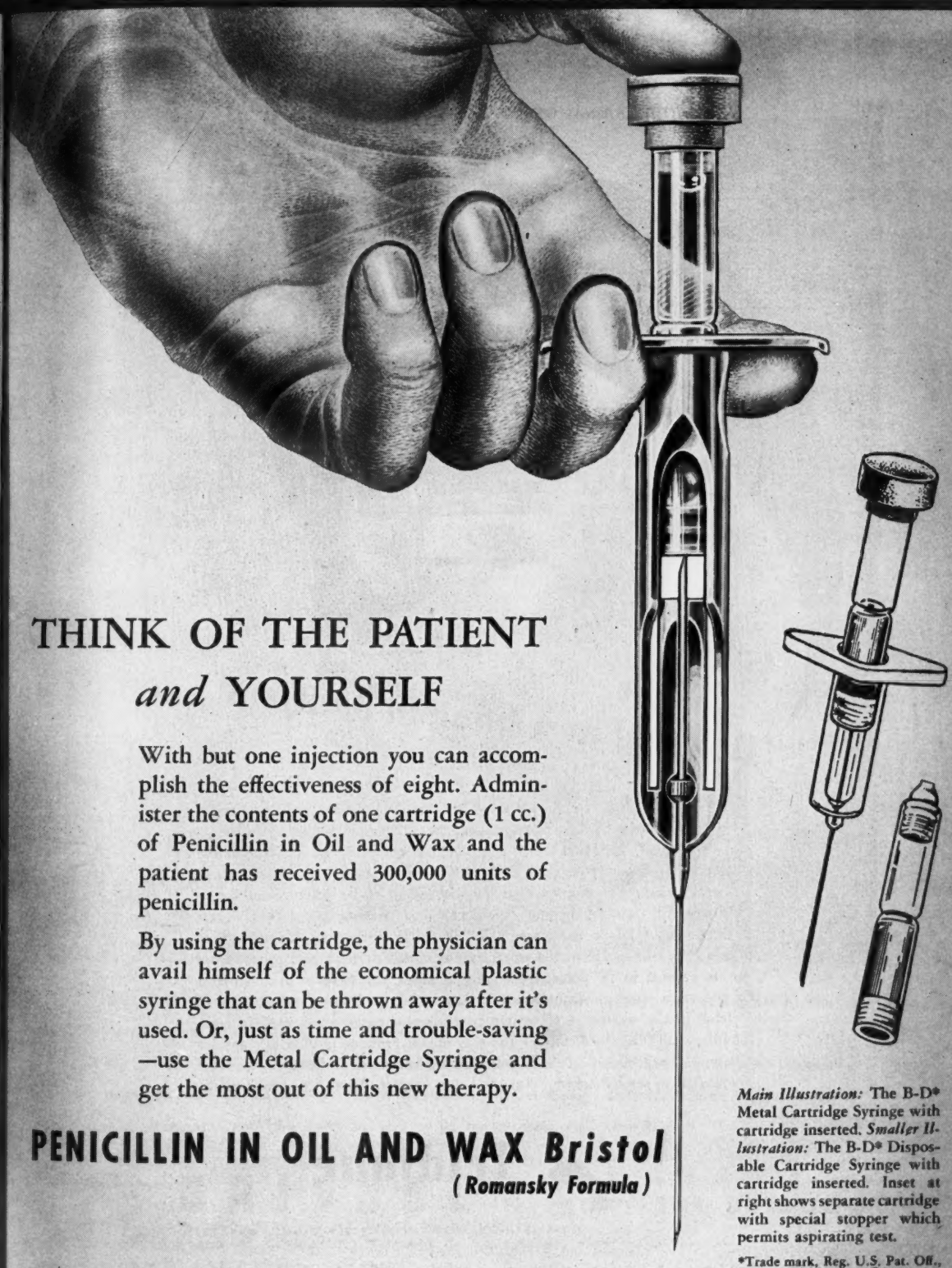

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1. *Lennox, W. G. (1945), Petit Mal Epilepsies: Their Treatment with Tridione, J. Amer. Med. Assn., 129:1069, Dec. 15.*
2. *DeJong, R. N. (1946), Effect of Tridione in the Control of Psychomotor Attacks, J. Amer. Med. Assn., 130:565, Mar. 2.*

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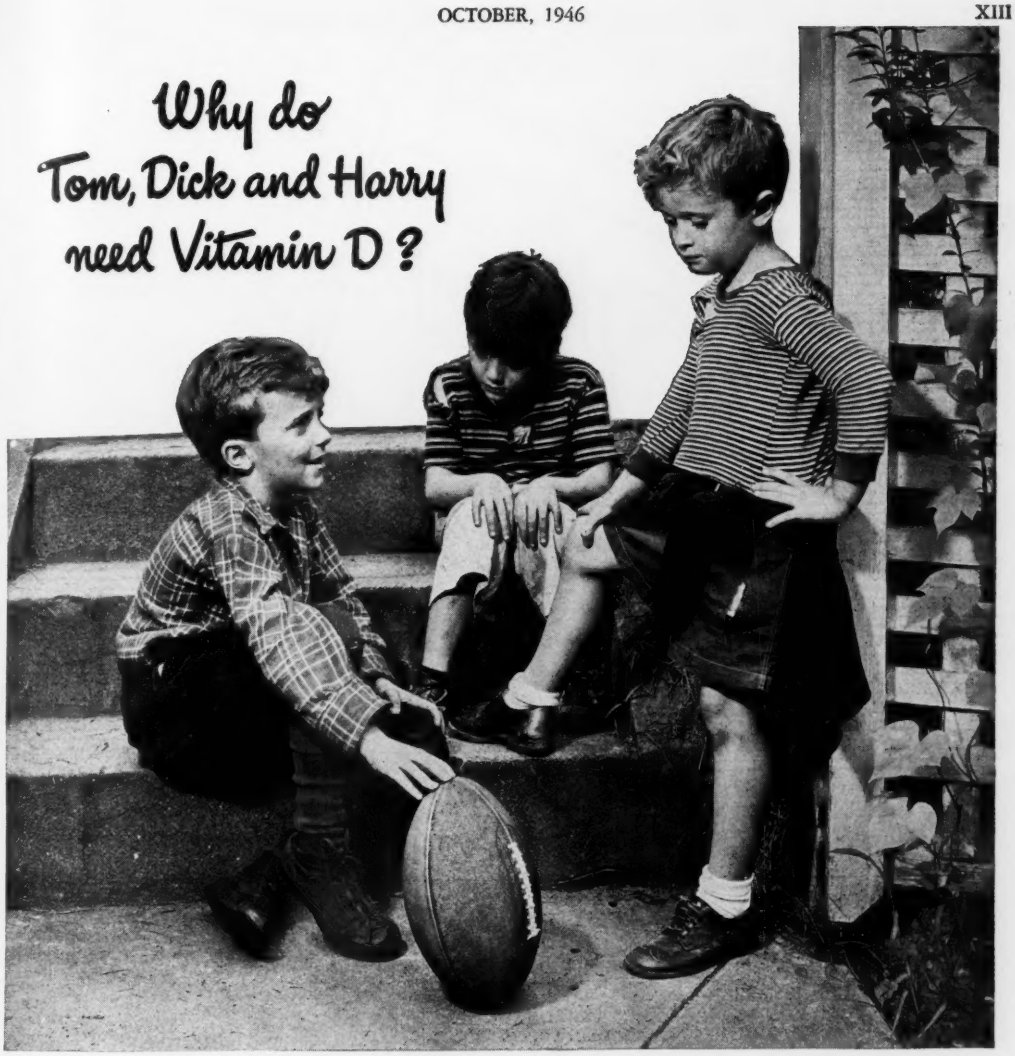

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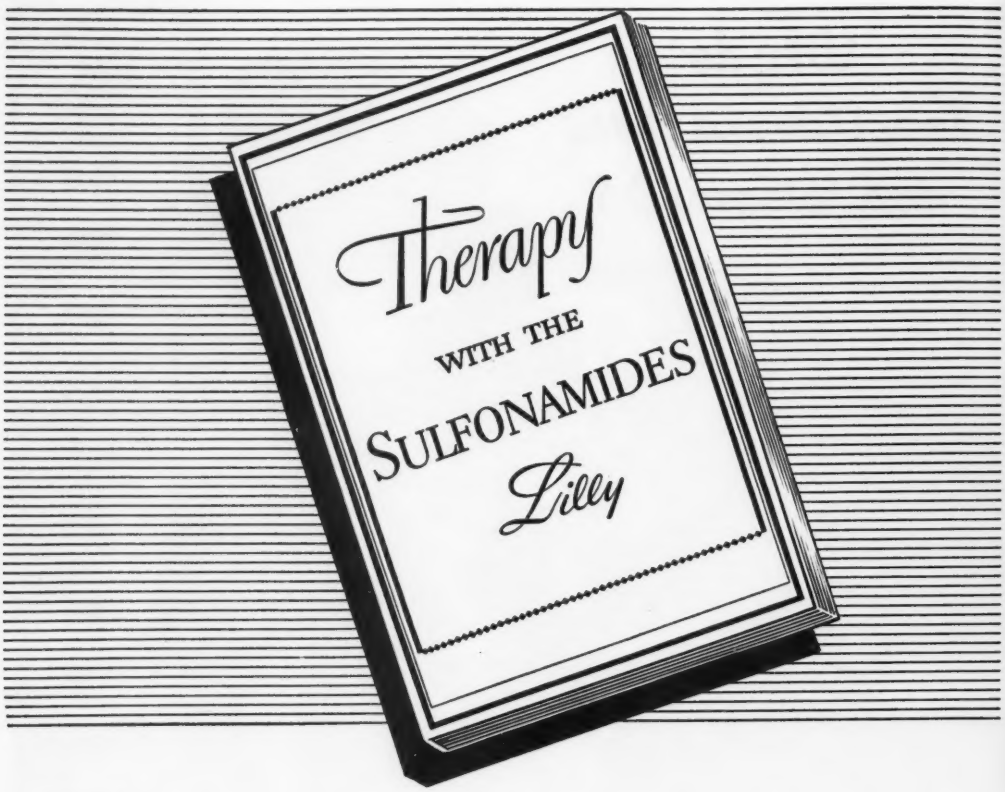

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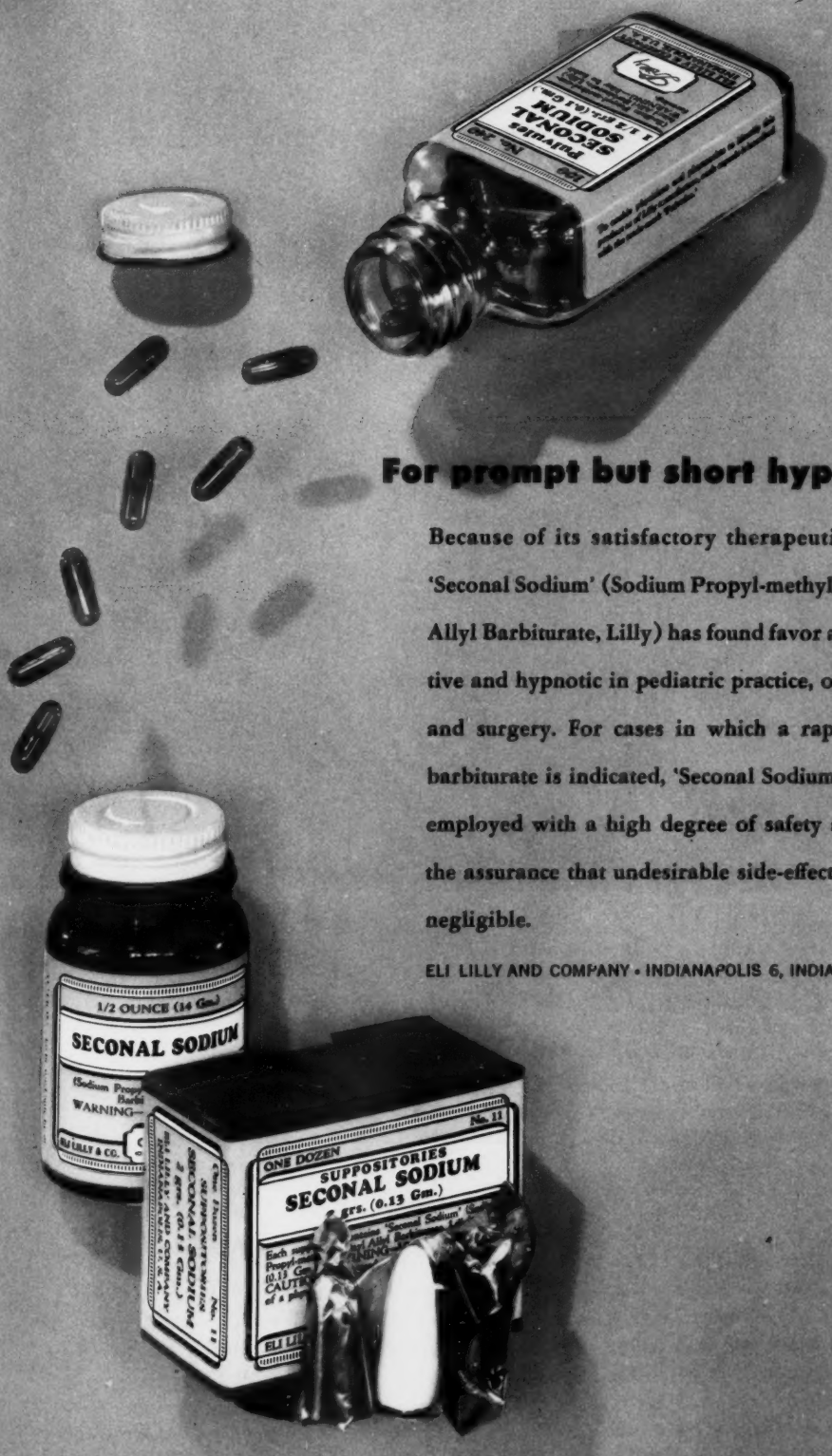

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Equal to any emergency

EVEN during his infrequent intervals of relaxation the physician's professional services are likely to be in demand. Young athletes require care that only a competent authority can provide. Prompt attention to a bruised knee, a sprained wrist, or a twisted ankle may prevent serious damage. And so it is that the physician often may be found in the stands at a baseball game, in the gallery at a tennis match, or on the bench at a football contest, prepared for any emergency that may arise.

The manufacturer of drugs and medicines also renders a service peculiar to him alone. During ordinary times his task is none too difficult, but he must be prepared to meet any emergency. In times of stress, production must be increased, distribution accelerated. During the recent horrifying crisis that engulfed the world, demand for new and better biological agents, improved pharmaceuticals, and blood plasma reached an unprecedented high. Eli Lilly and Company is proud of the fact that it was able to respond to wartime demands in full measure, without imposing serious inconvenience on civilian physician, pharmacist, or patient. Remaining shortages are rapidly disappearing.

A picture of The Good Samaritan provided the inspiration that

eventually led to the founding of Eli Lilly and Company

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HAZARDS IN THE UTILIZATION OF METALLIC EXTERNAL SKELETAL FIXATION IN THE TREATMENT OF FRACTURES*

Mather Cleveland, M.D.

New York City

One of the manifestations of the machine age that has invaded the medical field is the use of various metallic gadgets devised to reduce fractures and maintain their reduction. The salesmen who demonstrate these varying apparatuses work on dry bones which have been appropriately fractured by an osteotome. The doctors at every medical convention, large or small, are shown how a few simple twists of the side arms will bring the bones out to length and by rotation the fragments will slide gracefully into position. It's a pretty sight and it's so simple that anyone can do it. So why hesitate? The investment of $1000 or so in the necessary equipment is small compared to the boon about to be conferred on suffering humanity.

It's so plausible and so utterly simple working on that dried bone, but let's see what may happen when the dried bones have a blood supply, a periosteal envelope, are surrounded by living contracting muscles with nerves and blood vessels adjacent and an overlying skin and subcutaneous tissue. In other words, is the gadget the answer to the doctor's prayer in the treatment of fractures?

The Medical Department of the U. S. Army, through its medical supply, purchased an unknown but vast quantity of these external fixation jobs and the Hospital Corps of the U. S. Navy went off the deep end in recommending an apparatus of this sort by name. This naval recommendation found its way very promptly into one of the weekly news magazines early in the war. The follow-up studies on this critical survey are still to be published, I believe.

Some well known orthopedists prior to our entry into the war issued a report on some 60 odd patients treated by external skeletal fixation in a hospital in Britain. Later and more prolonged observation of these patients, who were still under treatment when our Army surgeons arrived, failed to corroborate the enthusiastic report. Many of the fractures were ununited and there was a high incidence of infection.

The experience in the Army with these methods of external skeletal fixation was not a happy one. Delayed union and pin hole infection occurred in a very high percentage of the fractures so treated. Soldiers treated by these means overseas and returned to the Zone of the Interior with pins incorporated in circular plaster of paris splints, arrived with ulcers leading down to the bone,—ring sequestra resulted and often frank osteomyelitis. The pins were found extending into joints or transfixing muscles and tendons and even major peripheral nerves with resulting paralysis. Pins which transfixed muscles and tendons caused pain, preventing the patient from moving the adjacent joints, and hence defeated one of the purposes of this form of treatment, which is presumably early motion. Foot drop was not infrequently seen, due to insertion of the pin through peroneal nerve branches. One general hospital reported three fractures in which gangrene of the extremity occurred, necessitating amputation of the leg. This was due to perforation by the pin of a major blood vessel.

The complications and risks involved were so great that these gadgets were peremptorily removed from all outlying hospitals and used only in a few carefully selected cases in the large fracture centers where the expert fracture surgeons were on duty.

In the European Theatre of Operations, the only excuse for the use of this external fixation apparatus was on a severe compound fracture with large loss of bone and soft tissue. In such a case it was very occasionally employed for a period of three weeks while a pedicle skin graft was in process of growing from the donor to the recipient site. Once the graft had taken, skeletal traction in balanced suspension was used to hold the fracture.

In the treatment of simple fractures, the external metallic skeletal fixation means a continuing com-

*Presented before the 87th annual session of the Kansas Medical Society, Wichita, Kansas, April 24, 1946.

pounding of the fracture or bone with its ever present possibility of infection. The prolonged use of the apparatus in treatment of compound fractures practically precludes the possibility of converting the fracture into a simple one by delayed primary closure of the wound.

With this preliminary survey of the set up, I should like to submit a few cases in evidence. Most of these came to our orthopaedic service at St. Luke's Hospital after they had gotten into trouble. One of them owes her trouble to us. In one instance we used the apparatus to achieve our purposes, realizing its dangers, and obtained a good result. There are two soldiers from one of our Army General Hospitals who were treated by this method.

CASE No. 1. (See Figure 1). M.P., Orthopaedic Service, St. Luke's Hospital, N. Y. C. This patient sustained a fracture of the lower extremity of left tibia and fibula, medial and lateral malleoli, and posterior tibial articular surface, so called "tri-malleolar fracture," 3 February 1936. Treated at another hospital by insertion of Steinman pins through the lower end of tibia and the os calcis incorporated in plaster of paris.

One year later the patient was seen by a member of our orthopaedic service with sinuses at site of both pins, a suppurative arthritis of the talocalcaneal joint and a suppurative osteomyelitis of the os calcis. Surgical drainage was secured by two operations. The wounds did not heal until December of 1940, almost four years after the fracture was sustained. After healing, the disability was marked because of

Figure 1. A. Roentgengrams, 13 February 1937, showing an anteroposterior and lateral view of the ankle and rear foot. Pin holes are obvious in the tibia and os calcis. Destruction of the subtalar joint and definite osteomyelitis of the tibia and os calcis may be seen.

B. Roentgenograms, 30 November 1942, show surgical fusion of the ankle joint, spontaneous fusion of the subtalar and midtarsal joints. Although the process has been healed, evidence of residual osteomyelitis of the tibia and os calcis is apparent.

C. Anteroposterior and lateral roentgenograms of the foot and ankle, April 1946, showing complete obliteration of all joints of the foot and ankle—an extremely unfortunate outcome.

equinus and the gradual destruction of the ankle joint. A wedge osteotomy of the ankle joint was performed and a stable weight bearing foot with 20 to 25 degrees of equinus secured in 1942. In August of 1943, almost seven and a half years after the original fracture, this patient had healed her wounds. There was spontaneous fusion of the joints of the tarsus. There remains a crippling disability.

In this instance, a simple fracture was compounded for a long period and infected, with a disastrous result, because of external skeletal fixation inadvisedly chosen as a means of treatment and utilized by a physician who was not technically competent. The pin driven through the tibia was almost through the fracture site. The os calcis, originally intact, became the site of a destructive osteomyelitis.

The original roentgenograms are in the archives of the first hospital. I should think that an open reduction and fixation of the posterior tibial fragment with one or two screws should have resulted in healing of the fracture and return of function within four to six months.

CASE No. 2. (See Figure 2.) M.R., Orthopaedic Service, St. Luke's Hospital, N.Y.C. This patient sustained a severe fracture at the right ankle, a so-called "tri-malleolar" type, 8 February 1945. Reduction and external fixation was attempted at another hospital by Steinman pins through the tibia and os calcis for counter traction. These were incorporated in plaster. This method failed to secure reduction of the posterior tibial articular surface. Twelve days later the patient was seen by a member of our staff and he decided to gamble on getting a good ankle joint by changing the type of fixation. The pins were withdrawn. There was no apparent infection and an open reduction was performed with internal fixation of lateral malleolus and posterior tibial lip by vitallium screws. One year later the patient has a perfect ankle with fractures healed eight to ten weeks after the operation.

In this instance external skeletal fixation was poorly chosen and failed to secure reduction. The prompt shift to internal fixation averted a certain painful ankle with limited motion and the possibility of infection through prolonged compounding. Such a shift in treatment has its dangers and the situation

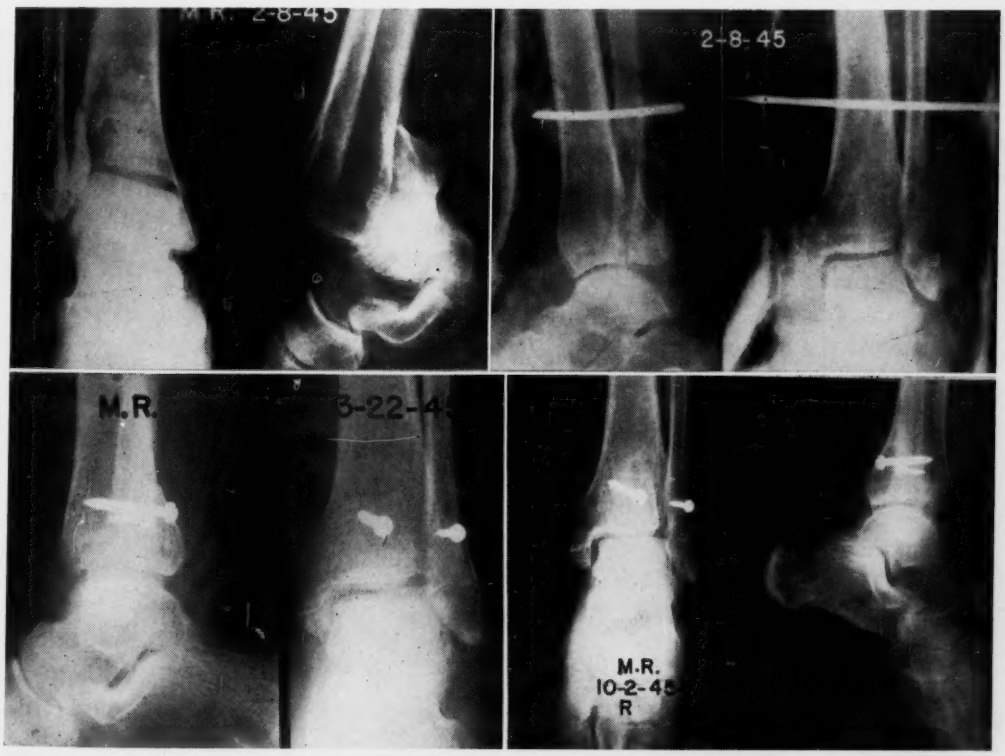


Figure 2. A. Anteroposterior and lateral roentgenograms of the right ankle showing the original fracture with marked displacement, 28 February 1945.

B. Anteroposterior and lateral roentgenograms of the right ankle, 28 February 1945, showing reduction obtained by pins inserted in the tibia and os calcis. The lateral view reveals the posterior tibial fragment still displaced upward un-reduced.

C. Anteroposterior and lateral roentgenograms of the same ankle, 22 March 1945, one month after open reduction and fixation with vitallium screws. Reduction is complete.

D. Anteroposterior and lateral roentgenograms of the ankle 2 October 1945, seven and one-half months after open reduction and internal fixation. Fracture entirely healed. A complete and perfect restoration of the ankle joint.

would have been much less complicated had the external skeletal fixation not been employed.

CASE No. 3. (See Figure 3.) M.O., Orthopaedic Service, St. Luke's Hospital, N.Y.C. February 1943. Admitted one month after injury. This patient sustained a fracture of both calcanei. An external fixation apparatus was applied to each with a pin driven through each os calcis and the tibia above for counter traction. This was performed at another hospital. The pin holes on the right leg all showed evidence of suppuration one month later. The tibial pin holes on the left leg at this time showed granulation tissue but no frank suppuration, and these healed uneventfully with wet dressings after removal of the pins. The right foot was seriously infected with a suppurative arthritis of the talocalcaneal and ankle joints, requiring incision and drainage and application of plaster of paris circular splint. The wounds healed seven months later.

The end result in this case, two years after injury,

Figure 3. A. Lateral roentgenogram, 22 December 1943, of the right foot after wounds had healed. Pin hole through the os calcis is plainly visible. Profound atrophy of all bones of tarsus is obvious. The ankle and subtalar joints show erosion of cartilage. The os calcis shows healing osteomyelitis.

B. Lateral roentgenograms of right foot, 7 December 1944, almost two years after the injury. Destruction of ankle and subtalar joints is even more obvious. The disuse atrophy has cleared up.

C. Lateral roentgenogram of the left foot, 7 December 1944, two years after injury, showing a slightly flattened os calcis, all joints of tarsus and ankle are normal. The foot narrowly escaped the fate of the right foot.

Had the pins been left in another week or ten days, there would probably have been a situation similar to that encountered on the right foot.

The original roentgenograms which are the property of the surgeon who inserted the pins are not available for this presentation.

Figure 4. A. Roentgenogram of a fracture of tibia and fibula, 28 March 1940, with a Steinman pin traversing the knee joint.
B. Anteroposterior and lateral roentgenographic views of the spontaneous fusion of this knee joint, 8 January 1941, ten months later. It should be noted that the fibular fracture is healed.

is a painful right foot with disability, due to complete loss of motion at ankle and tarsal joints.

This was a simple fracture compounded and infected by use of external skeletal fixation—an avoidable surgical disaster. Neither of these fractures was originally serious enough to warrant such treatment. Fractures of the os calcis with minimal displacement do extremely well with bed rest without fixation. If there is residual pain after healing, due to changes in the subtalar joint, a subtalar arthrodesis should be performed.

CASE No. 4. (See Figure 4.) F.D., Orthopaedic Service, St. Luke's Hospital, N.Y.C. This patient represents as bizarre an application of the use of extraskeletal traction and fixation as one could hope to see. In March of 1940 he sustained a fracture of the tibia and fibula of the spiral type. At another hospital one Steinman pin was placed in the os calcis and a second one through the upper tibia, supposedly, but actually it was driven through the knee joint by a thoroughly incompetent physician who had no training in bone and joint surgery. As a result of this malpractice, there developed a staphylococcus suppurative arthritis of the knee joint. The patient became very ill with 105 degrees of temperature. A member of our orthopaedic service was called after the damage was done. Incision and drainage and removal of the pin was performed and the knee joint progressed to solid bony ankylosis.

Six years later this patient is still having an occasional flare-up with an abscess to be drained.

This is a flagrant example of a potentially dangerous procedure utilized by an ignoramus, with disaster to the patient. This is a heavy price for any patient to pay.

Five years later patient was seen for incision and drainage of an abscess at the knee.

CASE No. 5. (See Figure 5.) E.M., Orthopaedic Service, St. Luke's Hospital, N.Y.C. Automobile accident 1930. Patient sustained a badly comminuted displaced fracture of left femur, 11 October 1930. Approximately three weeks later, external skeletal fixation was applied by two Steinman pins through the fracture site and two through the upper shaft of the femur, incorporated into two side arms. The fracture was reduced and in fact distracted. Osteomyelitis developed. Three operations were performed to remove sequestra and improve drainage. This fracture healed with malunion and a stiff knee.

The patient is rated as a total disability by the insurance company which was liable for this claim. She was under treatment for six years. Had she been treated by skeletal traction through the upper tibia or by Russell traction, a far better result would certainly have been achieved.

This is an illustration of a poor choice of treatment. External skeletal fixation was employed in a fracture which did not lend itself to that form of treatment. Steinman pins which traverse the fracture site invite infection in the devitalized tissue. The

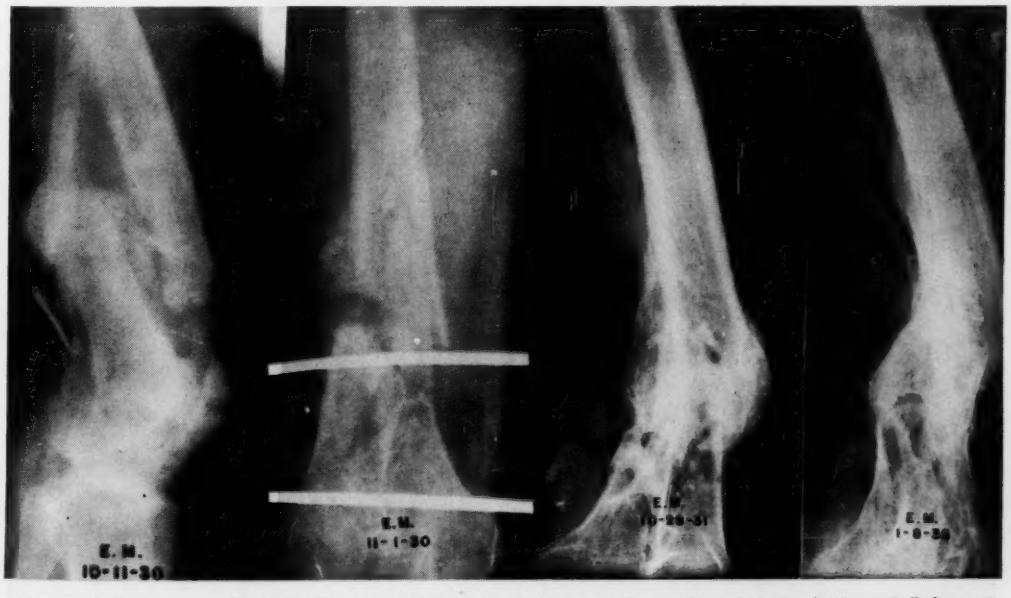


Figure 5. A. Roentgenogram, 11 October 1930, shows a lateral view of fracture of femur with marked comminution and displacement.
B. Roentgenogram, 1 November 1930, with fracture reduced and maintained by external skeletal fixation— three weeks later.
C. Roentgenogram, 28 October 1931, one year later, showing abundant callus. Pin holes still visible. Several obvious sequestra may be seen.
D. Roentgenogram, 8 January 1935, four and one-half years after injury. Femur healed and united with malunion obvious. The stiff knee joint does not show.

surgeon who treated this patient has long since abandoned the use of external metallic skeletal fixation in the treatment of fractures.

CASE No. 6. (See Figure 6.) T.C., Orthopaedic Service, St. Luke's Hospital, N.Y.C., 1936. This patient sustained a simple fracture of the right femur and a severely comminuted fracture of the right tibia extending into the knee joint—a coasting accident. This was treated by a Steinman pin and traction through the lower tibia. A dry gangrene of the leg below the knee developed and the patient and his family blamed this on the treatment used in this case.

The leg had to be amputated at the knee and a Gritti Stokes amputation was performed. Pathological examination revealed that the anterior and posterior tibial vessels were divided by the original injury.

This is an instance in which the pin fixation was unjustly blamed for a situation in which irreparable damage had been done to the main blood vessels. The surgeon here had to be extricated by the pathologist from a situation into which he placed himself by driving a pin through the lower tibia. The loss of the leg was inevitable following the injury sustained to the blood vessels.

CASE No. 7. (See Figure 7.) A.S., Orthopaedic Service, St. Luke's Hospital, N.Y.C. At seven years of age, on 1 March 1934, the patient was struck on right leg by a box thrown from a truck. He sustained a serious fracture at the ankle with displacement through the tibial epiphyseal line. There was a fracture of the fibula above the malleolus. A closed reduction secured adequate re-position of the fragments. The patient was discharged from hospital two days later in a plaster boot.

The second admission to hospital on 25 January 1940 showed three-fourths inch shortening of right tibia with varus deformity of the foot. Patient was then 13 years of age.

Since there was a medial bowing of the tibia and an obvious overgrowth of the lower fibular epiphysis and none at the lower tibial epiphysis, a wedge osteotomy was performed and a bone graft was inserted into the divided tibia to swing it into proper position. A plaster of paris circular splint was applied from toes to groin. This operation failed utterly. The deformity recurred.

The patient was re-admitted March 1941. Two Steinman pins were inserted below the deformity and two above in the tibia. The tibia was divided and pulled out to length, correcting the deformity. Chips from the ilium were inserted into the defect. Plaster of paris splint was applied over the pins. In three to four months an infection was noted. The tibia was pulled to length and united, *but* ring sequestra had developed.

27 December 1941—sequestrectomy was performed.

Figure 6. A. Anteroposterior roentgenogram of the right femur showing a fracture at the junction of upper and middle third. B. Anteroposterior roentgenogram of the right leg shows knee joint and severely comminuted fracture of the tibia entering the joint. C. Roentgenogram showing an anteroposterior view of the Gritti Stokes amputation stump. No fixation was utilized on this other than a firm bandage. An excellent end bearing stump was secured.

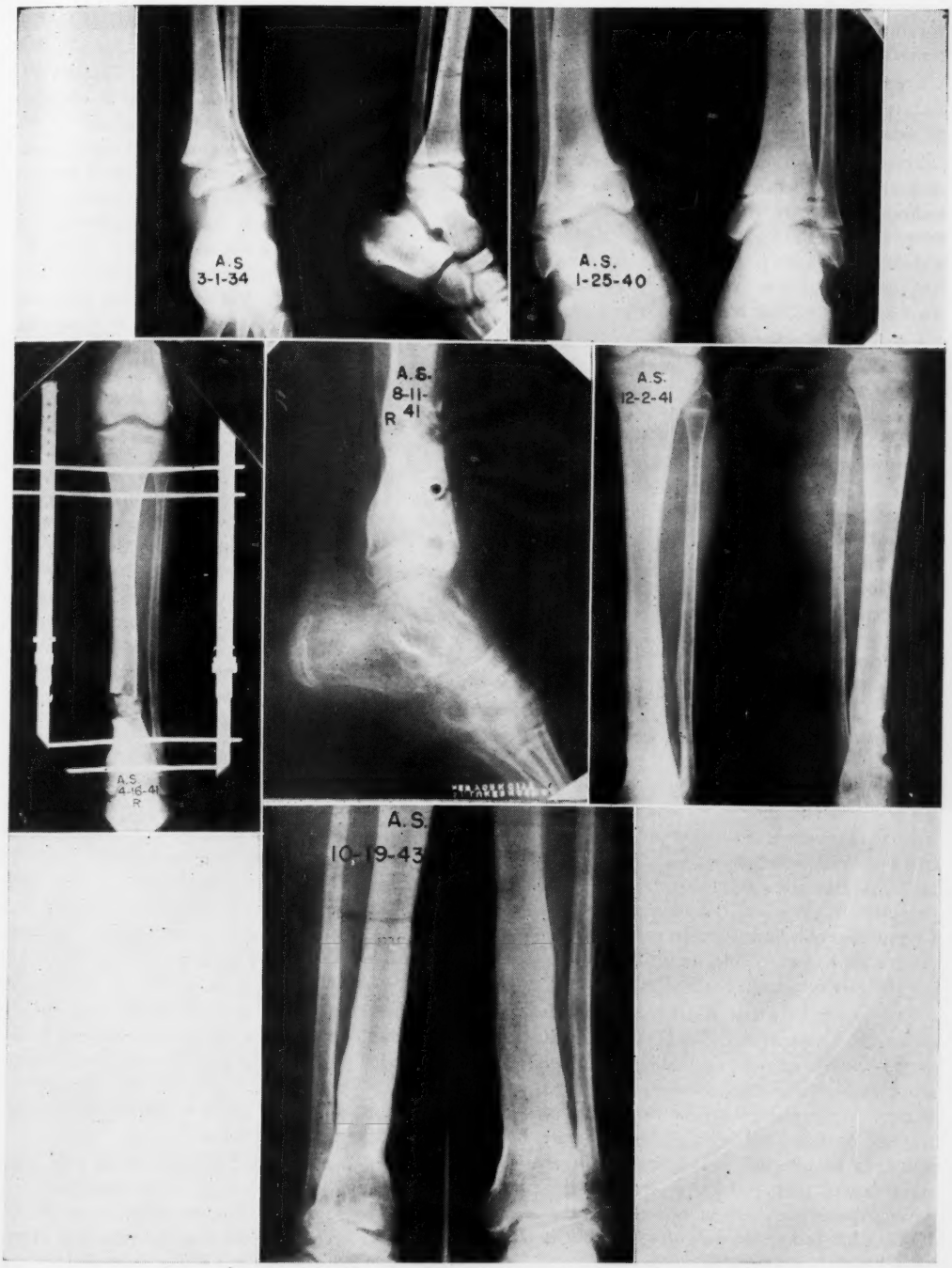


Figure 7. A. Anteroposterior and lateral roentgenograms of right ankle, 1 March 1934, showing fracture of shaft of fibula and tibia extending across the tibial epiphyseal plate.

B. Anteroposterior roentgenograms of ankle, 25 January 1940, six years later, showing arrest of growth to right tibial epiphysis with varus deformity due to persisting growth of the fibular epiphysis. The contrast with the normal ankle joint shows this obvious difference.

C. Anteroposterior roentgenogram, 16 April 1941, of the ankle joint and tibia with external skeletal fixation and correction of deformity by osteotomy and insertion of iliac bone chips. Two pins through the tibial shaft above and two below the osteotomy site.

D. A lateral roentgenogram, 11 August 1941, shows the healed osteotomy with ring sequestra in both the two lower tibial pin holes.

E. Anteroposterior roentgenograms, 2 December 1941, of the right tibia and fibula following sequestrectomy, showing healing of the osteotomy and also of the osteomyelitis.

F. Anteroposterior and lateral roentgenograms, 19 October 1943, of tibia and fibula and ankle joint, showing complete healing of osteotomy and osteomyelitis with correction of deformity. Eight and one-half years after the injury.

February 1944—excision of scar and pedicle graft from the calf of opposite leg.

Correction of deformity was achieved—osteomyelitis resulted, necessitating sequestrectomy and pedicle skin graft. *Final* result is excellent.

This is shown as an illustration of the use of extraskeletal fixation where it is necessary to correct deformity and secure lengthening of bone. It also shows the hazards of osteomyelitis which necessitated additional operative treatment, a perfect example of ring sequestrum due to torsion, traction and the trauma of drilling the bone.

CASE No. 8. (See Figure 8.) T/Sgt. J. S. Jeep accident 21 May 1945. Fracture of left femur, comminuted, compound. Fracture of right femur, simple. Peroneal palsy. Bilateral plaster of paris spica was applied. Removed at another hospital 2 June with transfusions and dressing of wounds. Arrived at a west coast Army General Hospital 24 June. Severe posterior angulation of both fractures. Skeletal traction was applied, utilizing 20 to 25 pounds weight. Left femur showed improved position, but right did not. The patient developed haematuria with pain in right flank, then symptoms suggesting gall bladder. He was placed in hip spica for transfer to an eastern Army General Hospital and was admitted there 5 August 1945. Wound on left thigh draining profusely. No evidence of union of left femur. Right thigh also showed a granulating wound with no evidence of union of the fractured femur. Skeletal traction in balanced suspension was reinstituted. The left femur was readily reduced once more, but the right femur was unaffected, so an apparatus for external skeletal fixation and reduction was applied, utilizing three screws in the distal and three in the proximal fragment. Satisfactory reduction of the fracture was obtained. An abscess of left thigh was drained 28 August. Penicillin was administered during the patient's entire hospital stay.

The external skeletal fixation apparatus was removed 26 October and patient was transferred to another Army General Hospital because the hospital at which he was being treated was closing. For this transfer a bilateral plaster of paris spica was employed. At this final hospital both fractures were found to be infected and drained profusely. The right showed profuse drainage from all the sinuses which marked the sites of insertion of the screws. Healing has progressed very slowly, but it is taking place.

This patient with one compound fracture of the femur, had the second femur compounded and infected by the use of an external skeletal fixation apparatus. He should have done infinitely better had he been promptly placed in skeletal traction with balanced suspension and not evacuated so far and so frequently until some union of these fractures had taken place.

CASE No. 9. (See Figure 9.) J.L., Captain. Patient sustained a simple spiral fracture of the shaft of the right humerus while playing baseball, 20 July 1942. He was admitted to nearby Army General Hospital, where metallic external skeletal fixation was employed to reduce and maintain reduction of the fracture. On inserting the pins through the distal fragment, difficulty was experienced in the insertion of the second pin, which was found later to impinge upon the first pin in the distal fragment. Although this fracture healed without symptoms, the roentgenograms showed progressive aseptic necrosis in and around the two distal pin holes. This aseptic necrosis was thought to have been due either to electrolytic action of the metals or to the heat caused by the friction of the contacting pin points at the time of insertion. This is an illustration of aseptic necrosis which failed to develop infection because the pins were removed within eight weeks. This is not usually the situation in the lower extremity and infection is more apt to intervene because of the much longer period of time during which the pins are employed. This fracture would originally have been much more easily treated by an open reduction and the insertion of one or two vitallium screws across the fracture line.

COMMENTS

A series of nine patients has been presented to show some of the complications which must be expected if external skeletal fixation is employed in the treatment of fractures. Infection is chiefly to be feared and six of these patients had osteomyelitis, suppurative arthritis, or ring sequestra. The prolonged suppuration for six years in two patients and seven and a half years in another, makes this particular complication one to be dreaded by the doctor and the patient alike.

The various types of external skeletal fixation are by no means simple to apply, nor should they be in the hands of any but the most experienced fracture surgeons. The pin thrust through the knee joint is evidence of forgotten anatomy and an attempt to substitute a gadget for brains.

Most of the bone and joint surgeons who have tried this method of fixation of fractures have discarded it because of the complications I have shown. These have occurred when the treatment was in the hands of competent men. When these gadgets are utilized by surgeons with less training, the incidence of complications rises sharply. This was seen in our Army Medical Corps to such an extent that the use of these external skeletal fixation apparatuses was prohibited in all but a few special instances.

A simple fracture, if adequately reduced, will heal

better and with less chance of complications than will a compound fracture.

I have shown five simple fractures which have been compounded by the surgeon for varying periods of time with resulting infection. Four of these led to disastrous results and the fifth is not yet healed.

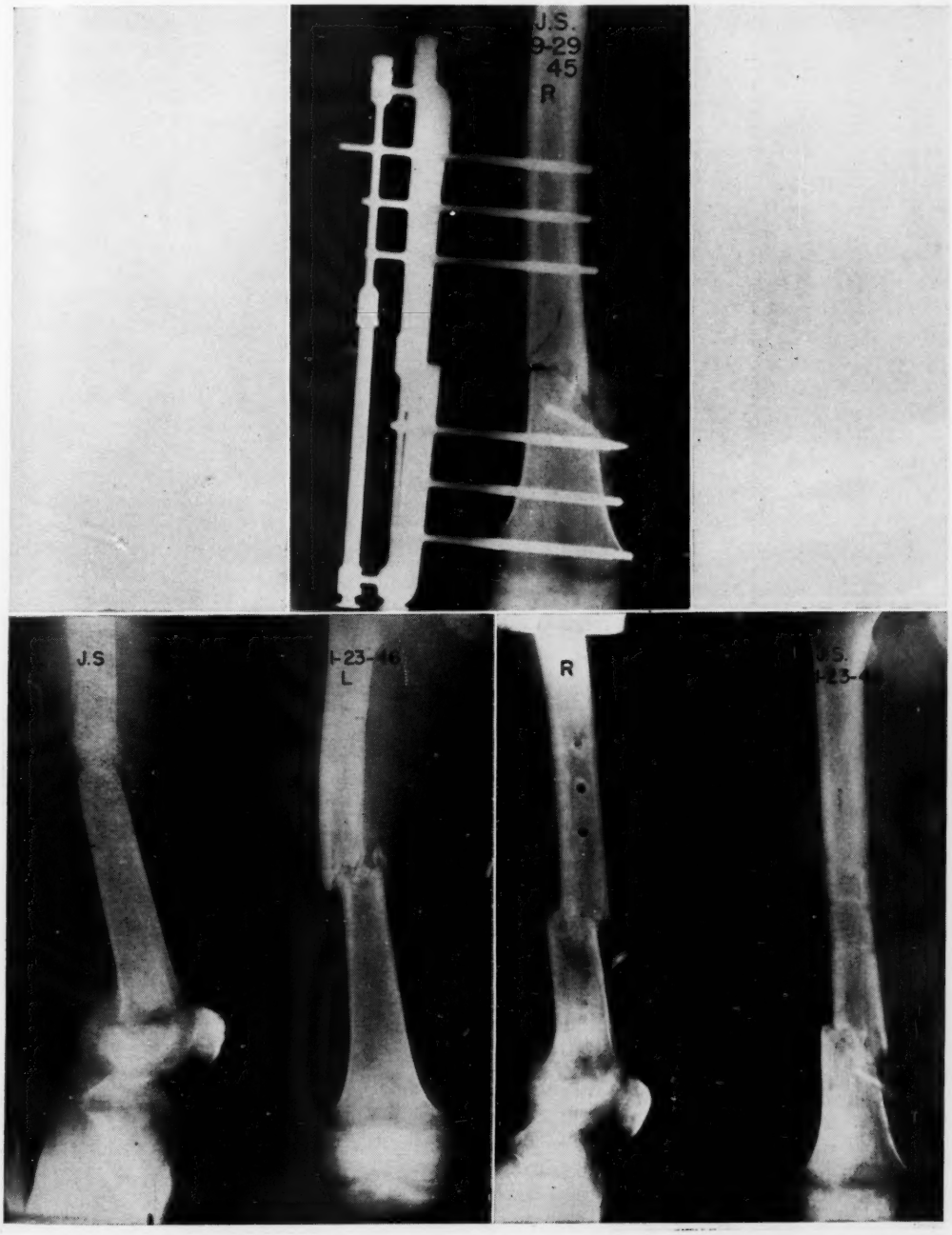


Figure 8. A. Anteroposterior roentgenogram, 29 September 1945, of right femur with the external skeletal fixation apparatus in place. The fracture is definitely reduced.

B. Anteroposterior and lateral roentgenograms, 23 January 1946, of the left femur, eight months after injury. Position is fair. Callus is not abundant.

C. Anteroposterior and lateral roentgenograms, 23 January 1946, of the right femur after removal of the apparatus. This is eight months after injury. The screw holes are very evident.

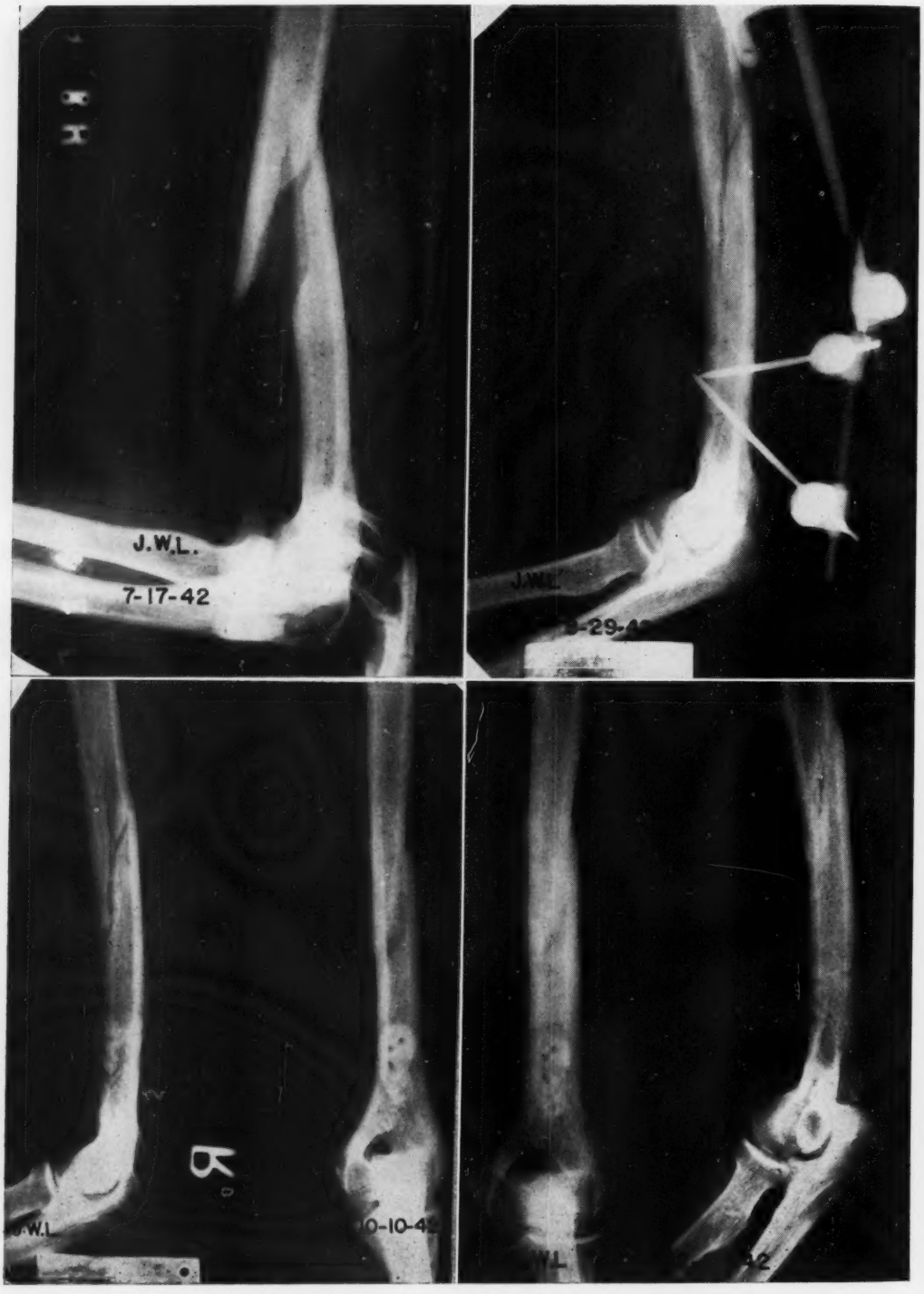


Figure 9. A. Roentgenogram, 17 July 1942, showing lateral view of the fracture.
Roentgenogram, 29 August 1942, showing fracture reduced with the external fixation apparatus and the pins in the lower fragment readily visible. Six weeks after injury.
B. Roentgenograms, 10 October 1942, anteroposterior and lateral view of the humerus showing the fracture healed with the pin holes readily visible and dense sclerosis of bones surrounding them. Almost four months after injury.
C. Final roentgenogram, 2 December 1942. Anteroposterior and lateral views of the shaft of the humerus show fracture solidly healed. A little under six months after injury with the aseptic necrotic changes still visible in the distal fragment.

PANCREATIC LITHIASIS

Edward H. Fischer, M.D.*

Kansas City, Kansas

Published cases of pancreatic lithiasis are slowly increasing in number. Approximately 220 have been reported since de Graaf's original description of this disease in 1667. We add the following to this growing list:

C.W., a 36-year-old white male, was first admitted to the University of Kansas Hospitals in July, 1944 complaining of recurrent attacks of abdominal pain and diabetes. He stated that he was last perfectly well eight years prior to admission. At this time, following a three-day drunk, he became ill with nausea, vomiting and severe epigastric pain. Later the pain became localized in the right lower quadrant of his abdomen. An appendectomy was done the following day. He stated that his surgeon told him he had a ruptured appendix. His convalescence was uneventful. He got along fairly well then until two years later when he began having recurrent attacks of severe, sharp, epigastric pain which radiated through to his back. These attacks came on about five minutes after meals, lasted about 30 minutes, and were accompanied by nausea and vomiting. The vomiting frequently relieved the severe pain. The vomitus contained partially digested food and bile. There was no hematemesis or melena. There was no food dyscrasia. On three occasions he passed very foul-smelling, light-colored, fatty stools. He stated that he had two or three such attacks over a period of three or four days and then would be quite well again for several weeks or months.

About four years after the onset of his illness, the patient developed a more severe attack of abdominal pain, accompanied by constipation, severe protracted vomiting, and abdominal distention. He was not relieved by gastric suction; therefore, an exploratory laparotomy was done. This, he was told revealed obstruction of the small intestine due to adhesions.

During the following two years he developed the typical symptoms of diabetes mellitus. This diagnosis was proved by laboratory examination.

One month prior to his admission here, his attacks of pain became more severe and also more frequent so that during that month he had from three to four attacks every day, some of which required morphine for relief. There was no jaundice or fatty stools at this time.

Past history revealed that he had the usual childhood diseases without complications. He had quinsy once and had several broken bones—all bones were broken by severe trauma.

The symptom review added nothing except that he was a heavy smoker and that he used alcohol excessively. Many of his attacks of pain were precipitated by alcoholic sprees.

There was no family history of diabetes mellitus.

Physical examination showed a well developed, well nourished white male of the stated age. Eyes, ears and nose were normal. The mouth showed high grade oral sepsis and dental caries. The tonsils were small and equal in size. The anterior tonsilar pillars were injected. There was bilateral anterior cervical lymphadenopathy. The thyroid was normal to palpation. Both lung fields were clear to auscultation and percussion. The heart was not enlarged and no murmurs were heard. The blood pressure was 120/80. There was tenderness to deep palpation in the epigastrium. Carnett's sign was negative. There were no masses and no rigidity. A healed right lateral rectus surgical incision was present. The extremities were normal except for slight deformity due to the old healed fractures. The reflexes were physiological.

Laboratory examination showed normal urine except for small amounts of sugar in some specimens. The red blood count was 4,720,000, hemoglobin 90 per cent, white blood count 12,900, and the differential count was normal. Blood chemistry was as follows: Cholesterol 307 mg. per cent, N.P.N. 23 mg. per cent, serum amylase 98 mg. per cent, blood sugars varied from 111 mg. fasting to 222 mg. per cent postprandial. Gastric analysis showed hypoacidity.

X-ray examination of the gastro-intestinal tract showed a moderate pylorospasm and irritability but no deformity of the duodenum. No segmentation was seen in the small intestine. The colon was normal.

At the time of this examination the X-ray showed numerous small opacities in the upper mid abdomen. Subsequent films localized these two to three cm. anterior to the twelfth dorsal and first lumbar vertebrae. The calcified deposits were irregular in outline, multiple and formed a cast of the entire pancreas. No other X-ray or laboratory examinations were done at this admission.

He was dismissed on a 125-75-75 diet and 30 units of protamine zinc insulin.

In December 1945, the patient returned to this hospital. During the interval he had been fairly well. His teeth has been removed and he had had another

*Dept. of Internal Medicine, University of Kansas School of Medicine, Kansas City, Kansas.

exploratory laporotomy for symptoms of intestinal obstruction. His doctor told him that his pancreas was "stony hard" and that he had many intestinal adhesions.

Physical examination at this time showed no marked change over that done previously.

Laboratory examination was as follows: Urine, normal except for finding sugar occasionally; Rbc. 3,810,000, Wbc. 15,600, hemoglobin 75 per cent, differential count normal; serology negative; blood cholesterol 236 mg. per cent, calcium 12.5 mg. per cent, phosphorus 5.6 mg. per cent., N.P.N. 25 mg. per cent, creatinine 1.2 mg. per cent, serum amylase 48 mg. per cent; stool fat determination—19.3 per cent weight of total fat, 6.3 per cent weight of free fatty acid, 6.1 per cent weight of neutral fat, 6.9 per cent weight of soap fat; gastric analysis normal; blood sedimentation rate 10 mm. in one hour by the Cutler method. X-ray examination showed some increase in the number of stones in the head of the pancreas; the gastro-intestinal series and gall bladder visualization were normal.

The patient's diet was increased to carbohydrates 200, fats 70, proteins 65. With this, it was necessary to increase his insulin to PZ 10-0-0 and crystaline 30-0-0. This indicated that there was no marked increase in the severity of his diabetes.

The pictures below are reprints from the X-ray plates taken on this patient.

DISCUSSION OF THIS DISEASE

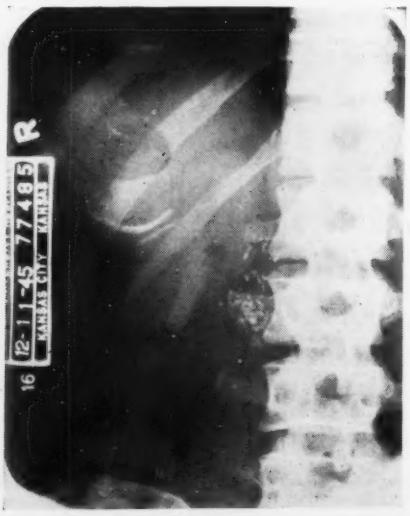
The deposition of calcareous material in the pancreas is now recognized as one of the causes of acute or chronic abdominal pain and diabetes mellitus. Therefore, the ante-mortem diagnosis of this condition becomes much more important than formerly thought.

The etiology of this disease is not known. Several theories have been advanced, none of which is entirely satisfactory. Two facts stand out: first, pancreatic stones are composed largely of tri-basic calcium phosphate and calcium carbonate with smaller amounts of organic tissue debris. Normal pancreatic juices do not contain calcium. It is known that many patients, like our patient, have repeated attacks of acute pancreatitis before calcium deposits are visible on an X-ray film. Therefore, it is postulated that through recurrent inflammatory reactions in the pancreas, the chemical composition of pancreatic secretions is altered and calcium deposits subsequently appear in the ducts and pancreatic parenchyma.

Other theories are (1) regurgitation of bile into the pancreatic ducts, (2) metaplasia of the epithelium of the ducts with resulting obstruction and pancreatitis, (3) desquamated, cornified epithelium producing nidus for stone formation. Chronic alcoholism occurs in a very high percentage of patients with this disease.

The pathogenesis of the disease is thought to be that of repeated attacks of varying severity of acute pancreatitis resulting in interacinar and interstitial fibrosis and the formation of stones in the pancreatic ducts. These stones then obstruct the ducts, resulting in dilation and thickening of the duct walls with atrophy of the acinar tissue. Then, as the disease progresses further, the islets of Langerhans are affected and diabetes results. The time required for calcareous change is not known.

The true incidence of the disease is undetermined. Undoubtedly many cases have been overlooked in the past. Only 100 cases were reported from 1667 to 1925. Since then at least 120 additional cases have been reported, indicating not an increase in the incidence of the disease but a more careful search for the



disease. There is no race predilection. Men are affected more frequently than women, in a ratio of two to one. The age incidence varies from six years to 72 years, with an average age of 43 years in 26 cases reviewed.

The clinical picture varies somewhat, yet the case reported here is quite typical. Pain is the outstanding and most constant finding; it occurs in 60 to 70 per cent of all patients with this disease. It is of two types. Severe coliky pains simulating renal or gall bladder colic is the most common. It often has a direct relationship to overindulgence in food, particularly fatty foods and alcohol. It is not accompanied by fever, abdominal muscular rigidity or adominal tenderness as is the pain due to pancreatitis, unless it persists, in which event pancreatitis is associated with the colic. Vomiting may occur. The other type of pain is that due to acute pancreatitis. Many patients have recurrent attacks of acute pancreatitis before stones are visible on the X-ray film. The coliky pain is usually epigastric in location and tends to radiate to the left and through to the back.

Fatty diarrhea is very common, as is creatorrhea. Over 50 per cent of the patients show this finding sometime during the course of the disease. It does not bear any particular relationship to the severity of the disease but depends on the location of the calcareous deposits. If these are in the large ducts and of sufficient size to cause complete obstruction, then steatorrhea results. Later as the stone is passed or edema of the duct disappears so that pancreatic juices again reach the gut, the stools become normal. Fatty diarrhea occurs commonly after bouts of colic. With complete destruction of acinar tissue or complete and permanent obstruction of the ducts of Wirsung and Santorini, steatorrhea and creatorrhea become constant and permanent, thus simulating sprue.

Diabetes mellitus occurs in about 50 per cent of these patients. At least three per cent of the pancreases of diabetics examined at autopsy show stones. Weight loss occurs very commonly.

Motor disturbances of the stomach and small intestine occur frequently. They may be of the hypo or hypermotility type, sometimes simulating peptic ulcer. Repeated attacks of nausea and vomiting are not uncommon. Secretory disturbances may occur as a result of disturbances of gastric motility. The motor disturbances of the G.I. tract are probably due to a nerve reflex mechanism.

Hepatic enlargement is present occasionally. It is thought to be due to involvement of the islet tissue with diminution in lipocaic secretion and fatty degeneration of the liver.

Ascites, edema and jaundice occur but these are uncommon. The latter may be due to a small stone passing into the common bile duct and producing transitory obstruction at the sphincter of Oddi.

Stones have eroded into the duodenum, producing duodenal hemorrhage with fatal result. Stones have also been passed in the stool.

Infections, particularly tuberculosis, frequently complicate the disease.

The laboratory findings vary greatly from patient to patient and from time to time. Elevated blood sugars and diabetic glucose tolerance curves are seen in those who develop diabetes. Increased serum amylase and lipase occur in acute pancreatitis. A decrease in pancreatic enzymes occurs with obstruction of the large pancreatic ducts. Increased fat and protein in the stools run parallel with the decrease in pancreatic juices.

The typical and pathognomonic finding in the disease is the demonstration of calcareous deposits in the pancreas. This is best done by X-ray. Anterioposterior and lateral views should be made of this region of the abdomen. The stones are usually dense, sharply outlined, multiple, and are grouped on both sides of the vertebral column. They are usually confined to an area bounded above by the upper level of the first lumbar or twelfth dorsal vertebrae and below by the lower border of the third lumbar vertebra. In the lateral projection they lie 2-3 cm. anterior to the spine. A duodenal tube in place helps locate the stones more accurately.

Four types of stones have been described by Gillies. They are (1) multiple irregular calculi (most common), (2) single calculi (rare), (3) multiple faceted stones resembling gall stones, (4) large fragmented stones which form a virtual cast of the pancreas.

The diagnosis then depends primarily upon the history and the X-ray findings. The later obviously is the most important. Surgical exploration is not needed to verify the diagnosis.

The differential diagnosis is not difficult. Clinically one should think of this disease in any patient who gives a history of recurrent or chronic upper abdominal pain, particularly if that pain is just to the left of the midline and associated with diabetes. The pain does not often localize in the right upper abdomen or radiate to the right scapula as does pain due to gall-bladder disease. The pain does not radiate into the lower abdomen or genitalia as in renal colic. The lack of food relief and alkali relief are points against peptic ulcer. These do not help in differentiating pylorospasm. Sprue need hardly be considered in the differential diagnosis, since pain, diabetes and pancreatic lithiasis do not occur in this disease.

Roentgenological examination affords the best means of study. As stated, anterio-posterior and lateral views should be taken. Gallbladder visualization should be done to exclude gallbladder disease and

cholelithiasis, particularly when the stones are of the multiple facet-shaped type.

Intravenous pyelograms will help to rule out calcification in a horseshoe kidney. Usually a flat K.U.B. plate will visualize the kidneys satisfactorily.

Calcified abdominal lymph nodes are usually paravertebral in location, tend to be larger, and occasionally form a longitudinal chain along the course of the ureters. A solitary calcified lymph node high in the mid-abdomen may cause a real problem in differential diagnosis.

Calcification in the splenic artery does not cause any great difficulty in diagnosis. The splenic artery lies obliquely, high in the upper left abdomen. This is not the anatomical location of the pancreas. The calcification has the appearance of a tortuous tube. The phenomenon occurs in older individuals.

Calcification in the abdominal aorta need hardly be mentioned. This occurs as small irregular plaques located longitudinally over the vertebral bodies and usually runs the entire course of the abdomen and chest. A duodenal tube in place will often help to accurately localize the anatomical position of the calcareous material in the upper abdomen.

The gastrointestinal tract should be examined for disturbances in acid secretion and motility.

Occasionally pancreatic cysts occur as part of the disease. When present they often produce distortions of position and shape of the stomach and duodenum. One should be certain that the gastrointestinal tract is free of barium when making studies of the pancreas itself.

The therapy is not obvious. The diabetes should be treated in the usual manner. Focal infection should be eliminated and if the patient is an alcoholic, this should be corrected. The administration of lipocaic with choline and Brewer's yeast are indicated if definite liver degeneration is present.

Many patients have had various procedures performed on them with varying results. Removal of a single or multiple stones confined to a small part of the pancreas is advisable if the patient is having symptoms that warrant surgical interference. Such symptoms are severe intractable pain, recurrent attacks of pancreatitis, or obstruction of the large pancreatic ducts with steatorrhea. Surgical interference is not warranted unless the patient is having the above symptoms or unless steatorrhea is present and the surgeon can remove stones from the large ducts.

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PRE- AND POST-OPERATIVE PARENTERAL THERAPY

Graham Owens, M.D.*

Kansas City, Missouri

In the last few years there have been many contributions to our knowledge of pre- and post-operative parenteral therapy. The new solutions available, and the revived interest in post-operative salt intolerance warrant a review of this subject. An attempt will be made to consider these new solutions, and to explain the concept of post-operative salt intolerance. We also wish to review and simplify the essentials of fluid and electrolyte balance physiology without entering upon the complex details of physiological and physical chemistry. In order to do this, it is obviously necessary to sacrifice at times strictly scientific accuracy for the sake of clarity.

In the pre- and post-operative period the patient may have need for any one of several of the following:

1. Cells
2. Electrolytes
3. Water
4. Plasma
5. Adjustment of acid-base balance
6. Caloric intake to maintain metabolism
7. Vitamins

These needs should not be met by guess work, but by sensible utilization of the clinical and laboratory aids at our disposal:

1. We must consider the present and past nutritional status of the individual. Has he been taking adequate food, fluid, and vitamins by mouth? Is he thirsty? Is his skin dry? Is the output of urine adequate?
2. Complete blood count
3. Hematocrit—normal 46 per cent

*From the Department of Surgery, St. Margaret's Hospital, Kansas City, Kansas.

if high—hemoconcentration
if low—hemodilution or microcytosis

4. Urinalysis—the specific gravity is of particular importance. (Urine concentration tests are an easy and reliable estimate of kidney function.)
5. Serum protein determinations
6. N.P.N., chlorides and CO_2 combining power
7. Accurate intake and output records

It should be our aim to keep all these factors as near normal as possible. It must be emphasized, however, that the blood chemistry findings may approach normal while the patient's fluid and electrolyte balance are completely abnormal. The clinical condition of the patient is, in the last analysis, the most important factor.

PHYSIOLOGY

There are two great fluid compartments of the body:

A. Intracellular water—50 per cent of body weight
B. Extracellular water—25 per cent of body weight
   1. Circulatory fluid
   2. Interstitial fluid

Distribution of the fluid and electrolytes between these compartments is largely regulated by the phenomena of osmosis and the Donnan equilibrium. Osmosis so regulates materials on either side of a permeable or semipermeable membrane that they tend to reach an equilibrium of concentration on both sides of the membrane. Capillary endothelium and cell walls are selective semipermeable membranes. The filtration pressure of the blood stream tends to force fluid and electrolyte from the circulatory to the interstitial compartment. The osmotic pressure exerted by serum proteins tends to counterbalance this and keep fluid in the circulatory compartment. Ions tend to reach an equal concentration on either side of a semipermeable membrane. The capillary endothelium is normally not permeable to serum proteins. Under normal conditions they remain in the circulatory compartment and so tend to hold water there. If they fail, or escape from the circulation, osmotic pressure falls and electrolyte bearing fluid leaves the circulatory to enter the interstitial reservoir with the production of edema.

There is a delicate distribution of water and ions in the compartments. Water can pass readily into and out of the cells. The potassium ion is confined to the intracellular fluid. The sodium ion is in the extracellular fluid and it cannot permeate the cell membrane. Sodium and potassium tend to reach ionic equilibrium on either side of the cell membrane. Sodium passes readily from the interstitial to the vascular compartment and is also excreted in certain amount by the kidney.

The concentration of extracellular sodium regulates the degree of cellular hydration. If extracellular sodium falls, the cells will take on water to lower the intracellular potassium concentration to equal that of sodium in the extracellular compartment. If the extracellular sodium rises, water leaves the cells to concentrate intracellular potassium until this equals the inonic concentration of sodium in the extracellular compartment. This gives cellular dehydration, and it is this process which is partially responsible for the phenomena of post-operative salt intolerance.

WATER LACK. Simple water deprivation or loss gives a dehydration of all fluid compartments and is characterized by: thirst, dry skin and tongue, oliguria, rising urine specific gravity (provided we have kidneys capable of concentrating well), slight hemoconcentration, rising N.P.N. In this situation the extracellular electrolyte (sodium) concentration rises. This draws water from the cells. However, normal kidneys should regulate the concentration of sodium, and if this is too high they excrete excess sodium to conserve intracellular water. Actually the kidneys do this, but water loss exceeds electrolyte excretion and the body in general remains dehydrated. Clinical dehydration, if the kidneys approach normal function, is accompanied by some degree of electrolyte depletion. Water loss or deprivation is therefore to be relieved by the administration of water and hypotonic electrolyte solution.

SALT LACK OR LOSS. Salt has great water binding power. Loss of salt results in extracellular dehydration with resultant cellular hydration, reduced plasma volume and hemoconcentration. It gives generalized weakness and an upset acid-base balance. It is not characterized by thirst nor relieved by water. Salt solution must be supplied to replace the electrolyte lack.

EXCESS HYDRATION. This can occur only in the pressure of depressed renal output. All body cells swell giving water intoxication which sometimes results in convulsions, muscular tremors and generalized cerebral depression.

EXCESS SODIUM CHLORIDE. In the absence of gross loss of salt, the administration of excess sodium chloride may give salt and water retention with cellular dehydration. Sodium chloride solution remains extracellular where the electrolyte concentration is increased, and this causes an egress of water from the cells. The kidneys should excrete the excess sodium chloride to preserve cellular water, but this they often fail to do, particularly in the period of post-operative suppression of renal function. This retention of sodium chloride and water can be much aggravated by a low serum protein which allows water and electrolyte to accumulate in the interstitial fluid compartment producing clinical or subclinical edema.

SHOCK. The present day conception of shock is

that it represents a type of peripheral circulatory failure characterized by progressive reduction in circulating blood volume due to increased capillary permeability. There is a loss of protein bearing fluid from the circulatory compartment with lowered serum protein and raised interstitial protein. This brings about reduced blood volume and a hemoconcentration with reference to the cellular elements of the blood. Hematocrit and red blood cell count values rise. In shock we can readily have the establishment of a vicious circle, loss of blood volume—decreased peripheral circulation—capillary anoxia—further increase in capillary permeability—more plasma and electrolytes into the tissue spaces—further loss of blood volume.

Thus people in simple shock (without hemorrhage) need plasma and fluid to replace their lost or inactive circulatory fluid. Oxygen is of great value in combating capillary anoxia. Fluid alone is of only temporary value, for, in the face of a deficient and falling serum protein it will escape from the circulatory compartment.

Burn shock presents practically the same problem except that it gives an actual loss from the body of plasma protein, fluid and electrolytes. Later the development of anemia probably caused by toxic factors may in severe cases require transfusion. Some workers now feel that whole blood should be given to the exclusion of plasma in all cases with severe burns. We feel that both are usually needed, and that by carefully watching the red blood count and the hematocrit we can give plasma when it is needed and whole blood when it becomes necessary.

The dosage of plasma and electrolyte should be adequate to restore and maintain normal blood pressure, hematocrit and cell count, and establish an adequate urinary output. Rules of thumb have been shown to be inaccurate in certain instances, and in all cases the clinical condition of the patient and his status as regards the simple laboratory determinations should govern dosage of parenteral material. However, it is said that in shock the administration of 100 cc. of plasma for every point the hematocrit exceeds 45 per cent or 50 cc. for every point the hemoglobin is above 100 will usually suffice.

HEMORRHAGE. In hemorrhage there is a loss of all elements of the circulatory fluid compartment. Water is taken into the circulatory fluid in an effort to maintain the circulating blood volume. This gives hemodilution with a fall in the hematocrit, lowered cell count, and oliguria with rising urinary specific gravity. Eventually capillary anoxia ensues and allows increased capillary permeability with escape of plasma to the tissue spaces. Therapy should be instituted before this happens so oxygen is again important. In the treatment of hemorrhage, our course is more clearcut than in other situations. Blood is easily available and should be given in quantity sufficient to approximate normal values. A hematocrit below 30 or a red blood cell count below three million is an indication for transfusion regardless of other factors in the condition of the patient.

WATER REQUIREMENTS. 1. We must replace already depleted body fluids. Many patients are dehydrated when we first see them. The patient who is clinically severely dehydrated is estimated to have lost or to be deficient to six per cent of his body weight. If we estimate his weight at 60 kilograms, we arrive at a 3600 cc. deficit which must be replaced in addition to supplying the daily need. Enough water should be given to allay thirst and lower the urine specific gravity to about 1.018.

2. There must be a daily replacement of SENSIBLE loss of fluid.

A. *Urine*—the normal kidney in a healthy adult which is capable of concentrating to 1.030 must excrete 600 cc. of urine daily to remove the normal waste products of metabolism. Post-operative tissue breakdown and fever increase the waste, and the kidneys may not be able to attain a specific gravity of 1.030 so we attempt to give enough water to assure a daily output of 1250 to 1500 cc. of urine.

B. Other drainage must also be replaced—vomitus, gastric suction fluid, biliary drainage, fluid from blood loss, etc.

3. We must replace the INSENSIBLE loss by perspiration and respiration which is estimated at 2000 cc. daily and this will always increase with fever and heat.

Coller's old rule for water replacement was as follows: Replace the sensible loss with isotonic saline solution; replace insensible loss with water and glucose; for each 100 mgm per cent that the plasma chlorides are below normal give 0.5 gm. NaCl per kilogram of body weight, and also provide 5.0 gm. total NaCl daily for maintenance. The latter has been found unnecessary because the ability of the kidneys to conserve sodium chloride is practically perfect.

Coller has retracted the above plan because he finds that it gives an excess of salt, and he has recently described the picture of post-operative salt intolerance. This is characterized by weakness, disorientation, nausea, vomiting and distension accompanied by a rising N.P.N., lowered CO_2 combining power in the face of constant blood chloride level. Accumulation of electrolyte bearing fluid in the serous cavities of the body may also take place. I think we have in years passed all seen this train of events, failed to recognize it and continued to add insult to injury by further administration of salt solution in an effort to restore the chemistry to normal.

The overload of sodium chloride in the post-operative period gives a hypertonicity with a shift of water from the intra to the extracellular fluid space. If post-operative fluid needs are supplied with isotonic saline solution, there will be approximately two liters of fluid transferred from the intra to the extracellular space. This situation is presumably caused by post-operative suppression of renal function due to anesthesia, shock, anemia, anoxia, and possible edema of the kidney itself.

Dr. Coller now recommends the following procedure for the regulation and supply of the need for water:

1. Supply enough water to allay thirst and maintain specific gravity of the urine below 1.020 with a daily volume of 1250 cc. to 1500 cc.
2. Give no sodium chloride in the first 48 post-operative hours except enough to replace the sensible extracellular fluid loss volume for volume with HYPOTONIC solutions (0.5 per cent NaCl fortified with 50 gm. of dextrose per liter or 1.38 per cent NaCl plus 0.11 $NaHCO_3$).
3. After the first 48 hours give one liter of Ringer's solution daily in excess of the above volume for volume replacement of sensible extracellular fluid loss.

For the last several years we have followed this general scheme. We have noticed a marked improvement in the general well-being of our patients since we abandoned the use of normal saline in the post-operative period. It has been of particular satisfaction in cases of gastric or intestinal resection. If saline is withheld, our anastamoses begin to function practically immediately, and we have never seen a serious disturbance of electrolyte balance in the early post-operative period.

PROTEIN NEEDS AND NITROGEN BALANCE

Plasma protein is essential in maintaining adequate osmotic pressure in the circulatory compartment. If the plasma protein level is low, any one or several of the following frequent complications may ensue:

1. Decreased intestinal motility and distention probably due to edema of the bowel wall.
2. Retarded wound healing.
3. Depressed renal function.
4. Decreased resistance to infection due to edema and to the fact that the antibodies are carried by the globulin fraction.
5. Decreased liver resistance to toxins.
6. Delayed emptying of anastamoses.
7. Increased incidence of bed sores.
8. Delayed callus formation in fractures.
9. Increased incidence of thrombosis.
10. Generalized debility, anorexia and slow recovery of strength.

With these potentialities in mind, it follows that the plasma protein determination should be as much a part of the pre-operative laboratory routine as the blood count and urinalysis.

In medical patients as well as in the pre- and post-operative cases we must beware of pre-existing protein nutritional deficit, lack of protein due to inability of some to take sufficient food by mouth, and loss by drainage, albuminuria and bleeding. Surgical prcedures increase both the loss and the lack of protein. There is post-operatively an increased breakdown of protein, increased nitrogen excretion and decreased nitrogen intake. There often is liver suppression which interferes with proper utilization of amino acids and protein.

The clinical manifestations of depleted body protein (weakness, edema, anorexia, hypoproteinemia) are really late signs. If the serum protein level is low, we have already a severe deficit in the fixed tissues. Even this sign may be masked by the hemoconcentration of dehydration. The body attempts to maintain plasma protein at the expense of tissue protein. A loss of one gram of plasma protein indicates a loss of 30 grams of protein from the fixed tissues. For this reason, it often takes a tremendous increase in protein intake over a long period of time to restore both fixed and circulatory protein to normal.

Plasma given intravenously will replace lost or deficient serum protein, but it must be hydrolyzed to amino acids before it can be utilized to rebuild tissue protein. This is a slow process, if it occurs at all. The amino acids are the building blocks of protein, and we can now give them intravenously. These preparations have been practically reaction-free and will maintain positive nitrogen balance. A patient is in nitrogen balance when the intake is equal to the output, and in positive nitrogen balance when the intake is more than the output.

There are two outstanding products at present in the parenteral amino acid field. Parenamine (Stearns) is a 15 per cent solution of amino acids derived from the acid hydrolysis of casein and fortified with tryptophane. It provides 60 calories per 100 cc. Parenamine is supplied in 100 cc. stoppered bottles, the contents of which are added to our regular intravenous glucose solutions. Amigen (Mead Johnson) is supplied as a five per cent solution of amigen powder in five per cent glucose solution.

Dosage of parenteral amino acids: The following will keep most patients in positive post-operative nitrogen balance: One gram of amino acids (Amigen or Parenamine) per kilo per day and 400-600 cc. 15 per cent solution (Parenamine) per day.

(60-90 grams amino acids per day)

(8-12 grams Nitrogen per day)

2-3 liters five per cent Amigen with five per cent glucose per day.

The dosage must be individualized and larger quantities given to those who are severely depleted, dehydrated, or in those who are losing large quantities of nitrogen through urine or serous exudates.

If the caloric intake in the form of carbohydrate is not sufficient for body requirements, our amino acids will be deaminated and used as carbohydrate. It is possible then to fail in maintenance of nitrogen balance in spite of giving seemingly adequate amounts of amino acid or protein. The caloric supply, exclusive of that derived from amino acids, must be kept above basal level if our amino acids are to be used for tissue metabolism. We give enough carbohydrate to satisfy the caloric need, deposit glycogen, spare protein and replace fat in the liver.

CALORIC REQUIREMENTS

Two to three thousand calories per day should be provided the patient in the pre- and post-operative period. It is important to remember that caloric needs are increased by fever, and by the demands of wound healing. We should bear in mind the caloric values of the solutions we administer and choose that solution or solutions which most nearly will approach the current need.

It is well to remember that 50 cc. of 50 per cent glucose provides only 100 calories and so is insufficient alone as a source of carbohydrate in the pre- and post-operative period. The yield of 1000 cc. of 10 per cent glucose is approximately 400 calories. An amount of 1000 cc. of 5 per cent Amigen in 5 per cent glucose solution gives 385 calories; 100 cc. of Parenamine give 60 calories. It has now been adequately shown that alcohol added to our solutions enhances the carbohydrate caloric value and also provides a frequently desirable sedative effect. Alcohol contains about eight calories per cc. It can be added to intravenous glucose solutions to make a 5 per cent solution of alcohol, thereby adding some 400 calories per liter of solution. This has been a very successful and practical way of increasing the caloric supply and is harmless if the solutions are administered slowly enough to avoid intoxication. A total of 1000 cc. of 10 per cent glucose with 5 per cent alcohol will give an intake of approximately 800 calories.

VITAMIN REQUIREMENTS

There are now available for parenteral use many fine vitamin preparations. We attempt to provide an excess of each over the daily requirement. All operative patients should be considered at least mildly deficient in vitamins. The preparation which we use can be added to any of the intravenous solutions given to maintain fluid, electrolyte and caloric intake. It contains thiamine 10 mg., riboflavin 10 mg., pyridoxine HCl 5 mg., calcium pantothenate 50 mg., and nicotinamide 250 mg., in a 5 cc. ampoule which is added directly to our other solutions. It has been shown that a large percentage of the population is deficient in vitamin C which is essential to proper collagen formation. Consequently we attempt to provide from 500 to 800 mg. of ascorbic acid daily either parenterally or by mouth in the pre- and post-operative period. This is added, with our B complex preparations to the bottles of glucose solution.

Vitamin K is necessary for the formation of prothrombin but is not absorbed properly when there is a deficiency of bile pigment in the intestine. This deficiency occurs particularly in the presence of obstructive jaundice. Vitamin K can be given by mouth provided dessicated bile is also given by mouth. We prefer to use the parenteral preparations either intravenously or intramuscularly as they seem to more surely and quickly return the prothrombin time to normal. No set dosage can be designated. Enough must be given to restore the prothrombin time to normal before operation. It is most important to continue Vitamin K in the post-operative period also. Despite the apparent operative relief of mechanical common duct obstruction, there is frequently edema which for some time prevents bile pigment from entering the intestinal tract, and patients usually do not take much by mouth immediately following biliary tract operations. A prothrombin time restored to normal before operation may, in the absence of the continuation of Vitamin K administration, again fall to a dangerous level. We have once seen the development of a large hematoma some days after the removal of a common duct stone when the continued administration of Vitamin K was overlooked in the writing of the post-operative orders for the patient.

ROUTE OF ADMINISTRATION

Any of the solutions can be given intravenously. This route provides a convenient, rapid and moderately comfortable infusion. We would like to warn against the dangers of repeated attempts to administer a venoclysis to the seriously ill patient. Such patients are quite often made most uncomfortable, exhausted and even thrown into shock by multiple attempts at venipuncture. The introduction of the needle should be undertaken with as much care as possible, and once introduced should be so fixed that it will not come out. We prefer to use the veins of the hand and forearm rather than the larger veins of the anti-cubital fossa, because if the latter are utilized the patient is unable to flex the elbow without dislodging the needle. If forearm and hand veins are used, and the needle properly fixed, the patient may be allowed sufficient movement of the arm to greatly enhance his comfort.

The use of the conventional arm board must be condemned. If the proper veins are entered, a loose

"reminder" bandage about the wrist and fixed to the bedsprings will assure adequate immobilization. If possible, infusions should be started and completed during the day—don't keep the patient awake and uncomfortable the entire 24 hours.

When undertaking procedures which are time consuming such as colectomies or those which may involve unexpected and severe hemorrhage such as difficult nephrectomies, it is our practice to introduce a 15 gauge cannula into the greater saphenous vein at the ankle before operation. This procedure often avoids serious and potentially fatal situations at the operating table. Anticipation undoubtedly saves many lives. Should something serious develop in the course of an operation, one can rapidly supply through the cannula any needed quantity of blood or plasma. This is often a source of great satisfaction to the surgeon who finds himself in a difficult predicament. We have drilled small holes through the hubs of our cannulas so that they can be sutured to the skin besides being tied into the vein. With this added precaution, the patient can freely move his leg about, turn over in bed, and sit up without fear of becoming disconnected from his source of fluid. The cannula also saves the discomfort of repeated veni-puncture. The long saphenous vein can almost always be readily visualized and it is very constant in location just mesial to the internal malleolus.

For some time we have also utilized the intramuscular injection of our fluids. Saline, five per cent glucose, vitamins and diluted solutions of the amino acids may be given by this route. It is not suitable for more concentrated glucose or amino acid solutions. A long needle is introduced deep beneath the fascia lata on the lateral aspect of the thigh. The solution will be absorbed about as rapidly as it can be given intravenously through a 21-gauge needle, and patients never complain of any appreciable discomfort.

In view of the adequacy of the intramuscular route we have abandoned the more slow and painful subcutaneous administration of fluid and feel that it should no longer be used.

The administration of a hypodermic of morphine a half hour before starting infusions of blood or fluid has been shown to greatly reduce the chance of reactions and should be a routine procedure.

INTAKE AND OUTPUT RECORD

Every chart of a patient undergoing a serious operation and involving the administration of parenteral fluid should have a separate fluid balance sheet. Many types of such records have been devised and almost all are adequate. The intake-output record should be computed from 6 A.M. to 6 A.M. so that the completed fluid balance sheet for the previous 24 hours is available when morning ward rounds are made. This will allow the program for the next 24 hours to be laid out accurately. If the totals are made to midnight, as is the routine in some hospitals, we are from 8 to 12 hours behind on the record when we see the patient in the morning.

It is imperative that the nurses be impressed with the necessity for keeping accurate intake and output records. The attending physician must first display some real concern about the matter before he can expect the nurses to be interested in the problem.

We have not used the pectin and gelatin solutions which have been mentioned in the literature. If plasma, blood and amino acids are as readily available as is now the case, there seems little reason to resort to gelatin, pectin or other less natural preparations.

ACID-BASE BALANCE

It is obvious that what has been said of electrolyte balance depends in large part upon the presence of adequate kidney function. If the principles discussed above are adhered to, acid-base balance will cause no great problem. It is important, when the post-operative N.P.N. value begins to rise abruptly, to increase the quantity of glucose and water that is given in an effort to increase the output of urine. One again must beware of giving saline solution in excess of the plan as recently described by Coller. Saline may cause edema of the kidney with further depression of the renal function. If we simply supply the water and glucose, the kidneys continue to play their part as filters and the increased urine output will automatically carry off the excess products of nitrogen metabolism. It must also be remembered that a sufficiently high blood pressure must be maintained to supply the necessary filtration pressure for the formation of urine.

SUMMARY

It is now possible to provide parenterally practically all needs for fluid, calories, nitrogen, vitamins and minerals. The nutritional status of the patient may be maintained for weeks at a time while he is unable to take fluid or food by mouth. In meeting these needs we should utilize the laboratory aids at out disposal but should be guided even more by the clinical condition of the individual patient. It is essential to allay thirst and provide an adequate urine output of proper specific gravity.

Administration of excesses of sodium chloride, particularly in the period of postoperative suppression of renal function, frequently leads to cellular dehydration and the clinical picture of postoperative salt intolerance. Coller recommends that no sodium chloride be given in the first 48 postoperative hours

except to replace sensible fluid loss with hypotonic electrolyte solutions.

Maintenance of protein levels both in the fixed tissues and in the circulatory compartment is essential and may now be accomplished readily by the use of parenteral amino acids. These are practically reaction free and will maintain nitrogen balance adequately. We have used them in large quantity for several years without serious reaction. The amino acids have undoubtedly done much to improve the nutritional status of our surgical patients.

Caloric intake in the form of carbohydrate must be provided or body protein and administered amino acids will be utilized to meet the ordinary daily energy requirements. Caloric intake can be fairly accurately computed since one gram of glucose yields approximately four calories.

All the solutions can be given intravenously and the use of a cannula in the greater saphenous vein is frequently helpful. The intramuscular route beneath the fascia lata is preferred to subcutaneous infusion.

An accurate intake-output record is essential in all cases requiring any amount of parenteral feeding. Acid-base balance presents no great problem if the scheme advocated by Dr. Coller is used, provided kidney function approaches normal and the blood pressure is high enough to maintain filtration.

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Approximately 300 nurses from all sections of the country were recruited by the American Red Cross in August for poliomyelitis service in a dozen states, it was announced recently at national Red Cross headquarters. Kansas was one of the states needing nursing assistance at the time the disease reached its peak here. All states of the union except Nevada and Rhode Island have reported polio cases this year.

In addition to providing emergency nurses, the Red Cross, in cooperation with the National Foundation for Infantile Paralysis, has sponsored demonstrations and instructions in poliomyelitis nursing techniques. It is also continuing courses for Red Cross nurse's aides in care of convalescent polio patients.

Medicine today is as much a social as it is a biological science. The doctor is not merely a technician but must be an important factor in the shaping and guiding of any satisfactory plan of medical service. It has been quite apparent in recent years that the medical profession, so largely concentrating on individual techniques and methods of practice, has failed to produce long-term, constructive policies or a sufficient number of public minded leaders who are qualified by point of view or experience to guide the development of sound local and national plans for medical care.

The country needs wise, courageous leaders in medicine, cooperating with industry, labor and the public to meet the health needs of the country and avoid the errors and mistakes of other health service programs such as have developed in the last 60 years in Europe. We must develop plans which will be suitable to the needs of American society under the guidance and direction of professional personnel on professional matters. There is every reason to believe that with patience and consideration of the complex adjustments that have to be made in the development of a medical service program adapted to the needs of present day society, the medical profession will be able to make a contribution of the greatest importance to the welfare of the country. If the profession is prepared to provide the necessary leadership and guidance, there is every reason to suppose that in substantial measure it will be able to remain in the position of determining the broad, over all professional policies.—*Willard C. Rappleye, M.D., in New York Medicine, August* 6, 1946.

The meat shortage may be to blame in part for the short supply of streptomycin. In production of the drug, which is penicillin's potent ally in fighting germ diseases, a need for beef pancreas was cited specifically by Dr. Chester S. Keefer, of Boston, at the American College of Physicians meeting in Philadelphia.

Trypsin enzyme from beef pancreas is needed for the preparation of streptomycin from the crude brew of soil organisms which produce the drug. Beef pancreas, however, is also needed to produce insulin for diabetes. At present insulin has also a high priority on the pancreas supply because there is not any too much insulin, without which thousands of diabetics would die.

Streptomycin production is much more difficult than penicillin production and the yield per quantity of fluid is smaller; about ten times as much streptomycin by weight as penicillin is required to treat a patient. From one-thirtieth to one-eighth of an ounce of streptomycin is required daily in the average case. It must be given by injection every three to four hours. This also contributes to the difficulty in getting enough of the drug to treat all the patients who want it.—*Science News Letter, May* 25, 1946.

Announcement of Hospital Allotments

Allotment figures to the states for the five-year hospital construction program authorized in the Hospital Survey and Construction Act were released last month by Surgeon General Thomas Parran of the United States Public Health Service. Kansas is allotted $37,908 for survey and planning and $933,750 for construction. On a national basis, the act authorizes the appropriation of $3,000,000 for surveys and $75,000,000 annually for five years for construction.

Of these amounts, only $2,350,000, earmarked for surveying and planning, has been appropriated to date. All states are to share in this amount on the basis of population, although a formula taking into consideration both population and per capita income will be used in allocating appropriations for construction.

Formation of a Division of Hospital Facilities to assist the surgeon general in carrying out the provisions of the act was recently announced. The division will be responsible for carrying out the functions which the U. S. Public Health Service is authorized to perform in accordance with the provisions of the act. This includes assistance to the states, their political subdivisions, and non-profit organizations in matters relating to the study, construction and operation of hospitals. In addition the division will assist in preparing regulations, determining allotments and grants and considering applications, plans and projects.

Purchase Trueheart Clinic

Dr. George Gill and Dr. Jack Dysart, associated in the Trueheart clinic at Sterling for several years with the late Dr. Marion Trueheart, recently announced that they had purchased the clinic and Dr. Trueheart's interest in the Sterling Hospital Association. They will continue to operate the clinic in the same manner in which it has functioned since its organization.

Examinations In Obstetrics and Gynecology

The American Board of Obstetrics and Gynecology, Inc., has announced that the next written examination (Part I) for all candidates will be held in various cities of the United States and Canada on Friday, February 7, 1947. All applications must be in the office of the secretary, Dr. Paul Titus, 1015 Highland Building, Pittsburgh, Pennsylvania, by November 1, 1946.

Parergon To Be Published

The Mead Johnson Company, long interested in art works by physicians, announces that the new edition of Parergon is now in preparation. Physicians who wish to have their work considered for inclusion in Parergon are asked to send glossy photo prints (8 by 10 preferred) to Editor, Parergon, Mead Johnson and Company, Evansville 21, Indiana. Art work considered may be in any of the following fields: oils, watercolors, sculptures, drawings, pastels, prints, etchings, engravings, lithographs, woodblocks, photographs, colored photographs, ceramics, woodwork, metalwork, jewelry, needlework, shipmodels.

The company also announces that the $34,000 prize contest for physicians' art work on the subject of "Courage and Devotion Beyond the Call of Duty" will be judged at the Atlantic City session of the A.M.A. in June, 1947.

It would be premature to make extensive claims about the merits of dicumarol in the treatment of coronary thrombosis. Adequate controls with which to determine its value statistically are not yet available and will be of little value unless several subdivisions depending on the severity, extension, and complications of each group are studied separately. Each of these subdivisions must contain a statistically significant number of controls and treated patients. This will be a long and difficult but important evaluation.—*Irving S. Wright, M.D., in American Heart Journal, July,* 1946.

Infectious hepatitis occurs sporadically and in epidemic form over a wide geographical area. It seems certain that the disease is caused by a specific virus with an apparent affinity for the liver. The disease in most cases confers lifelong immunity.

The transmission of infectious hepatitis, on the basis of present knowledge, takes place by contact of a susceptible person either with a patient having the disease or with material contaminated by the causative virus. It seems certain that the virus can be carried in food. It may be carried in water.

A plea is entered for the recognition and careful handling of infectious hepatitis. This disease clearly may cause irreversible liver changes. Our observations lead us to believe it is a serious disease in pregnant women.

Gamma globulin has no place in the treatment of the active phase of infectious hepatitis. It has been shown to be capable of producing immunity of six to eight weeks' duration and should be useful in the control of small outbreaks. Further study may prove that gamma globulin given during the incubation period can modify infectious hepatitis, in a manner similar to its action in measles.—*Harriet L. Hardy, M.D. and Roy Feemster, M.D., in New England Journal of Medicine, August* 1, 1946.

Malignant tumors of the jejunum and ileum are extremely difficult to recognize unless they cause obstruction. Some refinements of technic are now available, from which conclusions may be drawn as to the probable malignancy of obstructive lesions of the small bowel. It may be necessary to introduce a Miller-Abbott tube to the site of obstruction, and instill barium for careful fluoroscopic and spot-film study. Complete visualization of the small bowel may be secured by fractional administration of the barium meal; careful fluoroscopy may then enable the roentgenologist to detect the site of the lesion and study its contours. The diagnosis, however, is rarely made early because the patient usually is first seen during an obstructive crisis, when there is neither opportunity nor time for a study of the finer details of the mucosal pattern after locating the probable site of obstruction.—*Illinois Cancer Bulletin, July* 25, 1946.

While some of the histamine-neutralizing drugs in production and under clinical investigation are undoubtedly of great value, the belief expressed in some quarters that a universal treatment for allergy is imminent is not yet justified. From past experiences with the indiscriminate use of torantil, however, we can expect that when these histamine-neutralizing agents of greater potency become generally available, they will be widely used in all types of disorders, allergic and otherwise. It is well for the allergist to be prepared to evaluate properly the uses and limitations of these drugs.

The new agent, benadryl, will be of inestimable value in controlling the acute allergic phenomena, some of which have always been difficult to manage. It also gives the allergist an opportunity to search for the fundamental allergic factors, in the hope of securing lasting results.—*L. C. Todd, M.D., in North Carolina Medical Journal, July,* 1946.

PRESIDENT'S PAGE

To the Members of the Kansas Medical Society:

The Auxiliary of the Kansas Medical Society has grown steadily and healthily until it now has 538 members actively engaged in constructive medical projects. It would be difficult to overestimate the present influence of this group or its possibilities in the future with enlarged membership and a fine bulletin of their own.

The greatest contribution of the Auxiliary to date has been in combating compulsory health insurance and any increase in the furnishing of medical care by physicians who are servants of the state. This opposition to the control of medicine by government is a continuing process which cannot let up until the measure S. 1606 is decisively defeated. We must not be lulled into inaction by the recess of Congress.

As intelligent citizens we must admit the defects in the distribution of medical care and aid in their correction through improved sanitation, nutrition, housing, hospitalization facilities, and working conditions. Voluntary health insurance, started only nine months ago in Kansas, is proving a success and in a few years should be serving a large portion of the population. The Auxiliary can do a fine piece of work in educating the public about this service which provides good medical care for low income groups at prices they can afford on a prepayment basis. We only ask a little time to show what can be done by democratic methods.

President

EDITORIALS

Streptomycin Now Available

The National Research Council has announced that streptomycin has been made available to the profession beginning September 1 and will be distributed through authorized hospital depots. The new drug is a potent antibacterial agent. However, the results have been less spectacular than the press notices have portrayed during the past year.

The local hospitals have been notified what their allowances of the drug will be. A 100-bed hospital will receive 30 grams each month. The recommended dosage varies from five grams in tularemia and Hemophilus influenza meningitis to as much as 70 grams in brucellosis or in Salmonella infections. A physician who treats one of the latter group will be using all the streptomycin allocated to one hospital for a two-months period.

The Council has grouped the susceptible infections in two groups. In the first are definitely susceptible infections while in the second group the results have been less promising.

The high cost of the agent is also an important factor. The retail price at present is slightly over $26 per gram, or $260 for enough of the drug to treat the average urinary tract infection due to organisms resistant to other drugs. If 70 grams are used in a brucellosis, the cost of the drug will be $1,820.

"Streptomycin has been most effective in the treatment of tularemia, Hemophilus influenza infections, urinary tract infections due to gram negative bacilli, bacteremias and meningitis due to gram negative bacilli." (1) (2) The results in typhoid, brucellosis, Salmonella infections, peritonitis and pulmonary infections due to Friedlander's bacillus and other gram negative organisms have been inconclusive. At present its use in infections due to Mycobacterium tuberculosis is impractical. Streptomycin should be given intrathecally in meningitis cases and intrapleural injections used in the treatment of empyema to supplement the intramuscular doses.

It is obvious that each hospital should establish rules to insure maximum effectiveness and equitable distribution of its limited supply of the drug. It has been suggested that a committee consisting of a surgeon, an internist and the laboratory director have this responsibility. They would investigate each request for the drug and release it only to those within Group I, unless a sufficient reserve can be built up to justify using it when it is of doubtful value.

The physician prescribing streptomycin should not forget the high cost of the drug.

(1) *Streptomycin in the Treatment of Infections,* Chester S. Keefer, M.D., Chairman Committee on Chemotherapeutics and Other Agents, National Research Council, J.A.M.A., Volume 132, Number 1, September 7, 1946.

(2) *Streptomycin in the Treatment of Infections,* Chester S. Keefer, M.D., J.A.M.A., Volume 132, Number 2, September 14, 1946.

It Is Still a Privilege Vote November, 1946

It is still a privilege to be able to cast your vote for those men who have expressed themselves as candidates for the varying public offices. It is one of our rights as established by the Constitutions of the United States of America and the State of Kansas.

Individually, our weak little voices may not have much to do with the progress of the state and of the nation, but collectively, enough individuals, thinking and voting along the same lines, can exert a powerful influence upon the pattern of future legislation, be it medical, social or economic.

We therefore urge you to talk to various candidates, get your finger on their pulse, test out their brain waves, see what they stand for, make your decision and then cast your vote.

The Art of Medicine

Since antiquity the Art of Medicine has been recognized and utilized in many and varied diagnostic and therapeutic situations. It is far more ancient than the science and has developed with the cultures of our civilization. It has been defined as the practical application of the teachings of medical science. It is inclusive, the utilization of all known diagnostic and therapeutic measures, and also the manner in which all dealings with the patient are conducted. Perhaps the student in recent times has been given poorer training in the Art of Medicine than his predecessor because of the changing methods of scientific teachings.

It has been most aptly and appropriately stated by Houston that the placebo, something to please the patient, has always been the norm of medical practice. In spite of all the scientific progress, we still use drugs and other agents empirically, at first questioning their effects, later becoming boldly enthusiastic advocates for them. Many of these drugs or agents succeed in "ratio to the psychological influence of the physician and to the psychopathic complex of the patient."

Isn't it still true that in many conditions the advice, encouragement or counsel with the patient is far more important than the particular agent used? In fact in many illnesses the prescribing of a nonspecific or therapeutically impotent drug is only a

contact and the physician himself is the patent therapeutic agent. With all the radio, periodical, and detail man advertising at this time, it is little wonder that we "fall for" and utilize many therapeutic agents that will soon be forgotten (or at least should be).

The advancement of medicine will undoubtedly in the future, as in the past, be based upon scientific achievements, but it is to be hoped that the Art of Medicine will also approach some degree of perfection. It is only in the direction of a rational practice that we can visualize the continued progress of our profession. This must come about not through political manipulations, nor through public clamor, but through the increasing efforts of physicians to improve themselves and to eliminate ignorance and incompetence from our ranks.

DEATH NOTICES

ARTHUR EMANUEL HERTZLER, M.D.

Dr. Arthur E. Hertzler, 76, prominent surgeon and writer of Halstead, died September 12 at the hospital he founded in Halstead in 1902. He had retired from active surgical practice last February but had maintained contact with the clinic and hospital as a consultant.

He received the M.D. degree from Northwestern University Medical School in 1894 and did postgraduate work in Berlin from 1899 to 1901. On his return from Germany he taught pathology for five years at the University Medical College of Kansas City, and then for two years was surgeon and gynecologist there. In 1909 he became professor of surgery at the University of Kansas School of Medicine.

He had practiced surgery at Halstead for many years, and it was there also that he wrote many books, "Surgical Operations with Local Anesthesia" published in 1913, "The Peritoneum" published in 1919, and "Diseases of the Thyroid Gland," in 1922. He became widely known after publication of "The Horse and Buggy Doctor" in 1938, a book that has passed through 45 editions.

He was a member of the Harvey County Medical Society, the American College of Surgeons, the American College of Anesthetists, and the American Microscopical Association, of which he was president in 1911. He was also a member of the founder's group of the American Board of Surgery.

He is survived by his widow, associated with him professionally as Dr. Irene Koeneke, chief gynecologist at the Halstead clinic.

* * *

FLORENCE P. SIMMS CHAPMAN, M.D.

Dr. Florence P. Chapman, 69, a member of the staff of the Topeka State Hospital for more than 20 years, died September 10 while visiting in Akron, Ohio. A graduate of Ohio Medical University in Columbus, Dr. Chapman specialized in psychiatry. She was a member of the Shawnee County Medical Society.

COUNTY SOCIETIES

Dr. E. H. Gibbons, director of the Veterans Administration Medical Service Center, Topeka, has been speaker at a number of county society meetings during the past month, explaining details of the agreement between the Veterans Administration and the Kansas Medical Society and regulations covering examinations and treatment.

Dr. Gibbons spoke first at a meeting of the Saline County Medical Society at Salina on September 12, then at a meeting of the Butler County Society at El Dorado on September 13. On September 17 he met with members of the Cherokee County Society and had a part on the program along with Doctors Charles S. Huffman of Columbus, Clem Jones of Galena, C. H. Benage of Pittsburg and D. B. McKee of Pittsburg. He addressed a meeting of the Cowley County Society on September 19 and a meeting of the Riley County Society on September 24.

* * *

A meeting of the Marshall County Medical Society was held August 22 at the Hotel Pacific, Marysville. A business session was held, at which members voted to sponsor a proposed new memorial county hospital, and a scientific program included the showing of movies on intravenous anesthesia.

* * *

The Central Kansas Medical Society met September 26 at Ellsworth for a scientific program in the afternoon followed by dinner and a social program in the evening. Dr. Lawrence P. Engel, Kansas City, Missouri, discussed "Recent Developments in Surgery of the Upper Abdomen," and Dr. Harold T. Gainey, Kansas City, Missouri, spoke on "Management of Prolonged Labor."

* * *

The Riley County Medical Society, at a meeting held at Manhattan September 5, voted unanimous approval of petitions now being circulated urging construction of the proposed Riley County Memorial Hospital.

* * *

The September meeting of the Johnson County Society was held at the office of Dr. George L. Maser in Mission. Dr. H. A. Wenner of the University of Kansas School of Medicine was speaker of the evening and led a discussion on poliomyelitis.

* * *

A meeting of the Marion County Medical Society was held at Marion September 4. A scientific program was presented with Dr. W. W. Tate of Peabody discussing vascular disease and the use of exercise in treatment, Dr. A. K. Ratzlaff of Goessel speaking on injection and ligation of varicose veins, and Dr. R. R. Melton of Marion reviewing treatment of leg ulcers.

* * *

Members of the Clay County Medical Society held a dinner meeting September 11 at Cedar Court Lodge at Clay Center, followed by a scientific program at the Clay Center Municipal Hospital. Dr. R. Bruce McVay introduced a guest, Dr. Eugene Goforth, who is on the psychiatric staff of Winter Hospital, Topeka. Dr. Goforth discussed common psychiatric problems seen in Army and civilian life. Other guests of the Society were Dr. John Lattimore, Topeka, and Doctors George Bale, Jr., and Paul Adams.

Writes On Photo Micrography

Dr. A. J. Brier, Topeka, is the author of an article on photo micrography which appeared in the September issue of American Photography.

practically everywhere

. . . including the temperate zones, an unexpectedly high percentage of carriers of Endamoeba histolytica is to be found.

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(5,7-diiodo-8-hydroxyquinoline)

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SEARLE

RESEARCH IN THE SERVICE OF MEDICINE

Veterans Administration Agreement

Medical care under our agreement with the Veterans Administration is still not entirely understood by many members. There is repeated below a summary of the basic regulations. If these are complied with, the examiner will have less difficulty with this program.

EXAMINATIONS

The adjudication service makes the decision on all claims for pension. Whenever it appears that additional medical information is needed, the rating board will order a clarification or an additional physical examination. Many of these will be made in the veteran's local community under our agreement. In each instance an authorization is mailed and the examiner is selected by rotation if there are two or more in the locality.

Occasionally doctors have called the Medical Service Center in Topeka requesting authorization to make an examination for a veteran. Such authorization can never be granted since every authorized examination to be paid for by the Veterans Administration must be first requested by the adjudication service.

If a veteran requests an examination to be made and an authorization for this examination has not been received, the physician may make the examination if he wishes and may send it to the regional office. Payment for this examination is the patient's responsibility. Since the Veterans Administration did not request this examination, they will not pay for it. The reason is obvious. A veteran dissatisfied with his rating might go to many doctors, hoping eventually to find one who can produce evidence that will allow his case to be reopened. Should the veteran succeed in having his case reopened, then the Veterans Administration probably would authorize additional examinations. They are, therefore, willing to accept examinations made on any veteran but will pay only for those they have requested.

TREATMENT

Space prohibits a complete explanation of this topic. The following outline, however, will give the general picture. Cases that do not fit into the outline should be referred to the director of the Medical Service Center in Topeka for decision.

Office and home treatment for men and women can be authorized for service-connected disabilities only.

Hospital care for men is for service-connected disabilities only.

Hospital care for women may include any disability, whether service-connected or not, with the exception of normal pregnancy and syphilis acquired out of line of duty.

Veterans studying under Public Law 16, male or female, are eligible for all care, whether or not disabilities are service-connected. This is not to be confused with the regulation covering students who are under the G. I. Bill of Rights, Public Law 346, who are eligible only for srevice-connected disabilities as defined above.

A service-connected disability, broadly speaking, is an illness or a disability which occurred or was aggravated during his or her military service. In certain instances, as in malaria or the presence of shrapnel, the condition may be considered service-connected even though the record does not substantiate the fact. A third method of determining a disability to be service-connected is through the adjudication service of the Veterans Administration.

Always write the Medical Service Center in Topeka before treating a veteran. In cases of emergency, telephone for authorization. The Veterans Administration will pay only for those specific items in the treatment of the veteran that have been authorized. Should additional services be necessary, additional authorization must be obtained.

In applying for authorization for treatment, always give the patient's name, his claim number or his Army serial number. Give a diagnosis and the type and duration of treatment that will be required.

THE HEART CLASSIFICATION

The section below is reprinted from the Manual for Medical Examiners published by the Veterans Administration. It is requested that every examination pertaining to the heart comply with the classifications that are listed hereafter, since the rating board uses disability tables that are geared to these classifications.

The following examples illustrate the construction of a diagnosis under this system:

I. (1) *Cause.*—Syphilis.
(2) *Structural lesion.* Aortic insufficiency; cardiac enlargement.
(3) *Manifestations.*—Myocardial insufficiency; ventricular premature contractions.
(4) *Capacity for work.*—Class V.

These characterizations may also be recorded as: Syphilitic disease of the heart, with aortic insufficiency, cardiac enlargement, myocardial insufficiency, ventricular premature contractions; class V.

II. (1) *Cause.*—Coronary arteriosclerosis.
(2) *Structural lesion.*—Myocardial damage.
(3) *Manifestations.*—Anginal syndrome.
(4) *Capacity for work.*—Class III.

This characterization may also be recorded as: Coronary arteriosclerotic disease of the heart, with myocardial damage and the anginal syndrome; class III.

III. (1) *Cause.*—Rheumatism (rheumatic fever).
(2) *Structural lesion.*—Mitral stenosis. Cardiac enlargement.
(3) *Manifestations*:—Auricular fibrillation. Myocardial insufficiency.
(4) *Capacity for work.*—Class IV.

This characterization may also be recorded as: Rheumatic disease of the heart, with mitral stenosis, cardiac enlargement, auricular fibrillation, myocardial insufficiency; class IV.

IV. (1) *Cause.*—Syphilis.
(2) *Structural lesion.*—Saccular aneurysm.
(3) *Manifestations.*—Pain.
(4) *Capacity for work.*—Class IV.

This characterization may also be recorded as: Syphilitic disease of the aorta, with saccular aneurysm and pain; class IV.

V. (1) *Cause.*—Hypertension.
(2) *Structural lesion.*—Cardiac enlargement.
(3) *Manifestations.*—Myocardial insufficiency.
(4) *Capacity for work.*—Class II.

This characterization may also be recorded as: Hypertensive disease of the heart, with cardiac enlargement and myocardial insufficiency; class II.

VI. (1) *Cause.*—Hypertension and coronary arteriosclerosis.
(2) *Structural lesion.*—Myocardial damage; cardiac enlargement.
(3) *Manifestations.* — Anginal syndrome; intraventricular block.
(4) *Capacity for work.*—Class IV.

This characterization may also be recorded as: Hyper-

ANALYSES OF NUTRITIVE VALUES:

Campbell's STRAINED BABY SOUP

	CHICKEN	LIVER	LAMB	BEEF	VEGETABLE
Solids %	11.8	13.3	13.9	13.7	13.4
Protein %	2.63	3.42	3.09	3.91	1.95
Fat %	1.5	0.9	2.1	0.9	0.5
Carbohydrate % by difference	6.4	7.5	7.2	7.6	9.3
Calories per ounce	14	15	17	15	14
Crude Fibre %	0.15	0.29	0.30	0.22	0.43
Calcium %	0.026	0.013	0.046	0.046	0.024
Phosphorus %	0.042	0.065	0.068	0.068	0.051
Iron Mg. per 100 g.	.22	.72	.35	.40	.73
Copper Mg. per 100 g.	.24	.35	.12	.17	.24
Manganese Mg. per 100 g.	.075	.173	.054	.053	.018
Vitamin A—I. U. Per 100 g.	1766	7000	1130	1693	2550
Thiamine Mg. per 100 g.	.018	.080	.036	.037	.069
Riboflavin Mg. per 100 g.	.040	.62	.068	.072	.064
Ascorbic Acid Mg. per 100 g.	1.1	7.3	2.7	3.9	7.5
Niacin Mg. per 100 g.	.77	1.54	1.22	1.29	1.05

5 KINDS:

CHICKEN
BEEF
LAMB
LIVER
VEGETABLE

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tension and coronary arteriosclerosis, with myocardial damage and cardiac enlargement, anginal syndrome and intraventricular block; class IV.

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Class II.—Patients with a cardiac disorder who develop symptoms with ordinary physical activity, but are able to carry on slightly reduced physical activity without symptoms.

Class III.—Patients with a cardiac disorder who are unable to perform more than moderate physical activity (ordinary activity, moderately reduced) without symptoms of myocardial or coronary insufficiency.

Class IV.—Patients with a cardiac disorder who develop symptoms and sometimes signs of myocardial or coronary insufficiency on more than greatly limited activity. Such patients are not usually employable in industry, although they may pursue purely sedentary occupations that do not require speed or effort.

Class V.—Patients with a cardiac disorder who are unable to perform any exertion without symptoms and signs of myocardial or coronary insufficiency, and are confined to bed.

New Quarterly Journal

The publication of a new journal, the Quarterly Review of Dermatology and Syphilology, has been announced by the Washington Institute of Medicine, Washington, D.C., as an event marking its fifteenth year in the fields of medical publication and library research. It is the tenth in the Institute's group of reviews covering specialized fields of practice.

The new publication will survey all published material on dermatology and syphilology appearing anywhere in the world from January 1, 1946, onward.

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ANNOUNCEMENTS

October 7-10—Fall Conference, Kansas City Southwest Clinical Society, Kansas City, Missouri.

October 7-11—Course in Clinical Allergy, sponsored by American Academy of Allergy, Marquette University School of Medicine, Milwaukee, Wisconsin.

October 9-12—Examinations, American Board of Ophthalmology, Chicago, Illinois.

October 21-23—Assembly, United States Chapter International College of Surgeons, Detroit, Michigan.

October 28-31—Fall Clinic, Oklahoma City Clinical Society, Oklahoma City, Oklahoma.

October 28-November 1—Annual Assembly, Omaha Mid-west Clinical Society, Omaha, Nebraska.

November 17-23—Inter-American Congress of Radiology, Havana, Cuba. Information may be secured through American College of Radiology, 20 North Wacker Drive, Chicago, Illinois.

December 4-5—Meeting, Kansas State Board of Medical Registration and Examination, Kansas City, Kansas.

December 7-12—Fifth Annual Meeting, American Academy of Dermatology and Syphilology, Cleveland, Ohio.

March 17-20—Sixteenth Spring Clinical Conference, Dallas Southern Clinical Society, Hotel Adolphus, Dallas, Texas.

April 28-May 2—Annual Session, American College of Physicians, Chicago, Illinois.

MAY 12-15—ANNUAL MEETING, KANSAS MEDICAL SOCIETY, TOPEKA, KANSAS.

BOOKS RECEIVED

Complete Handbook on State Medicine. By J. Weston Walch. Published by Platform News Publishing Company, Portland, Maine. Copyright 1946. 170 pages. Price $2.50.

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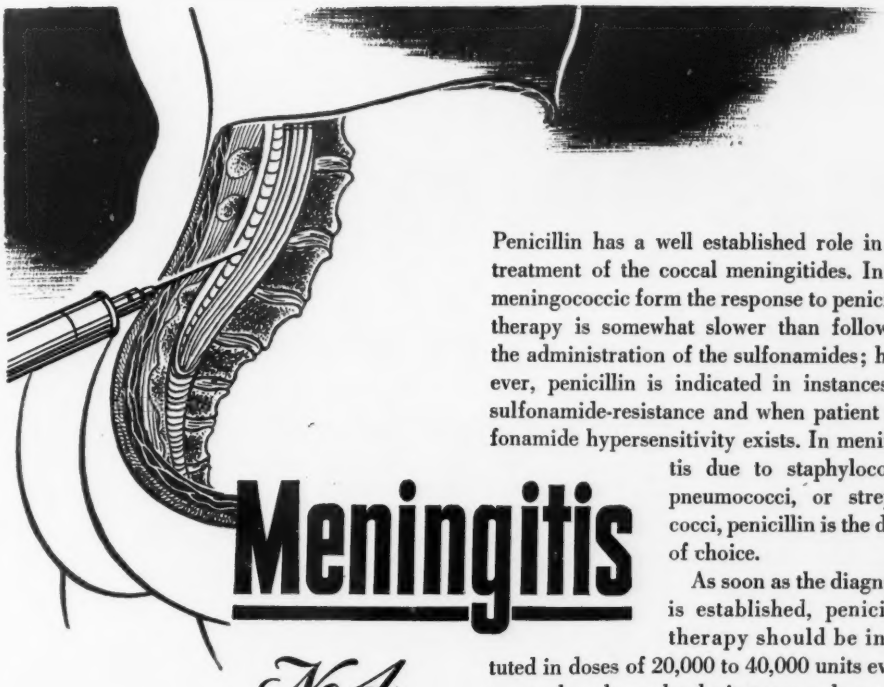

Meningitis

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SPINK, W. W., *and* HALL, W. H.: *Penicillin Therapy at the University of Minnesota Hospitals: 1942-1944, Ann. Int. Med. 22:510 (April) 1945.*

WHITE, W. L.; MURPHY, F. D.; LOCKWOOD, J. S., *and* FLIPPIN, H. F.: *Penicillin in the Treatment of Pneumococcal, Meningococcal, Streptococcal, and Staphylococcal Meningitis, Am. J. Med. Sc. 210:1 (July) 1945.*

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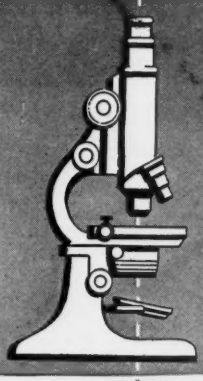

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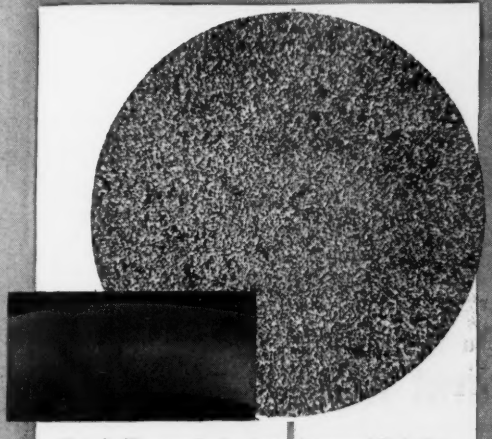

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**Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154.*
Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60.

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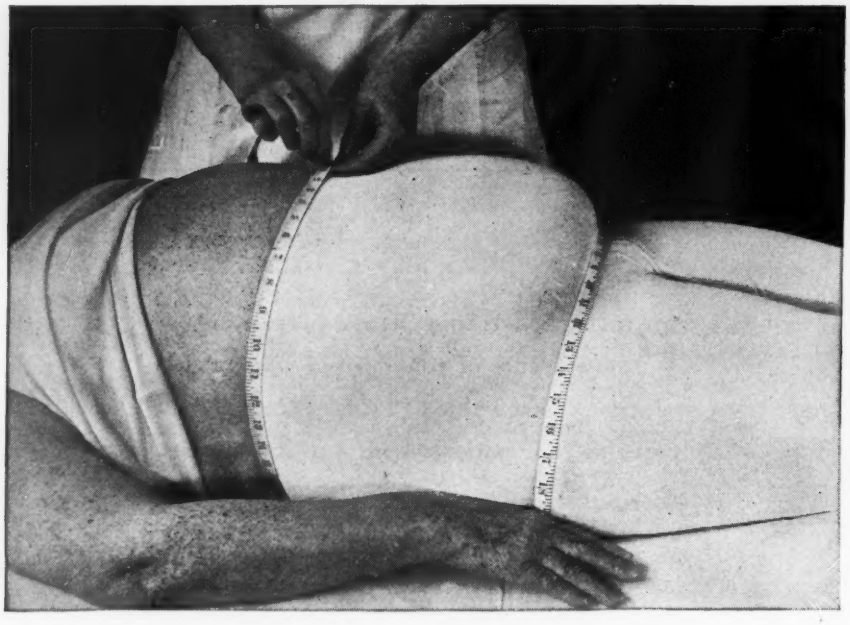

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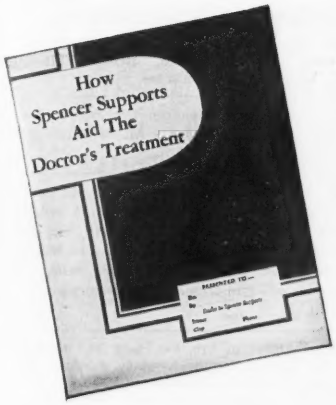

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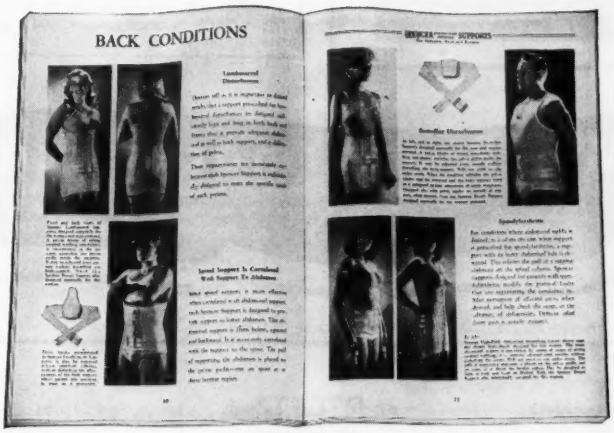

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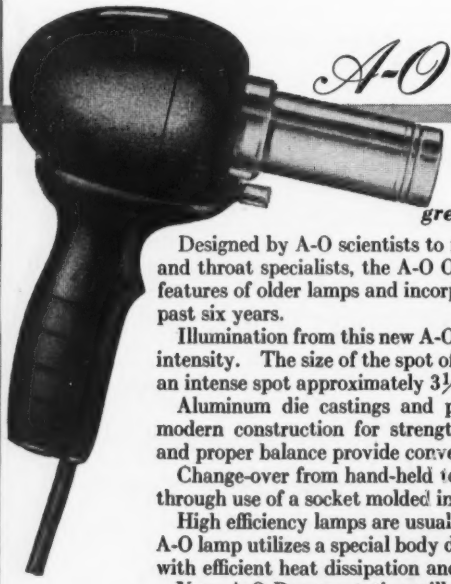

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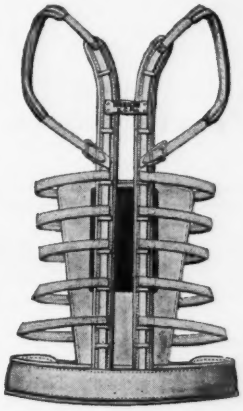

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*Frazer, J. G.: The Golden Bough, vol. 1, New York, Macmillan & Co., 1923

It is ironical that the practice of attempting to cure rickets by holding the child in the cleft of an ash tree was associated with the rising of the sun, the light of which we now know is in itself one of Nature's specifics.

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